THE IRON AGE

New York, Thursday, August 2, 1906.

The Youngstown Sheet & Tube Company.

The New Bessemer Steel Plant and Finishing Mills.

A recent notable addition to Bessemer steel capacity is the new plant of the Youngstown Sheet & Tube Company at East Youngstown, Ohio, which is now practically completed. It is particularly noteworthy in being the only Bessemer steel plant built in this country for some years, as new additions to steel capacity have latterly been open hearth exclusively. It embodies in its construction modern equipment throughout, money having been spent freely to secure the very best appliances for the making of a maximum output of Bessemer steel at the lowest possible cost. A view in the converter house of this plant is given herewith, Fig. 1.

The company when organized was named the Youngstown Iron Sheet & Tube Company, but about a year ago the name was changed. Upon being organized the company secured about 200 acres of ground at East Youngstown, on which it erected in 1901-1902 a plant comprising puddling furnaces, a muck train, a skelp mill rolling up to 22⅝ in. wide, a pipe mill and sheet mills. The product then consisted of black and galvanized sheets, roofing sheets and pipe up to 8 in. in diameter, all made in iron and steel. The company made its own iron, but bought its steel largely from the Republic Iron & Steel Company. In 1904 important additions were made to the pipe department, enabling 12-in. pipe to be turned out, and the output was brought up to about 1000 tons a day of sheets, skelp and pipe.

Early in 1905 the company took up actively the matter of building a Bessemer steel plant and finishing mills to supply its own requirements of steel, and also to furnish billets and sheet and tin bars for the open market. Sufficient ground was available for building the new works through the foresight of the management in making the original purchase of a site. It was necessary, however, to provide funds for building and running the steel plant and bonds to the amount of $2,500,000 were issued, practically all of which were taken by the original stockholders. The company has a paid-in capital of $4,000,000 and an undivided profit or surplus of $2,000,000 and $2,500,000 in bonds, making a total working capital of $8,500,000.

The plant is most admirably located as regards railroad facilities, having direct connection on the north with the Pittsburgh & Lake Erie and the Baltimore & Ohio railroads and on the south with the Pennsylvania Company's lines. Under an arrangement with the Pittsburgh & Lake Erie Railroad the Erie and the Lake Shore systems also have direct connection with the plant. The Mahoning River touches the property, furnishing an ample supply of water. The nature of the ground was well adapted to supporting heavy foundations, very little excavating being necessary. All the buildings are most durably constructed. A very clear idea of the general layout of the plant can be had from the accompanying ground plan, Figs. 2 and 3. Our limit of page space made it necessary to show this ground plan in two parts.

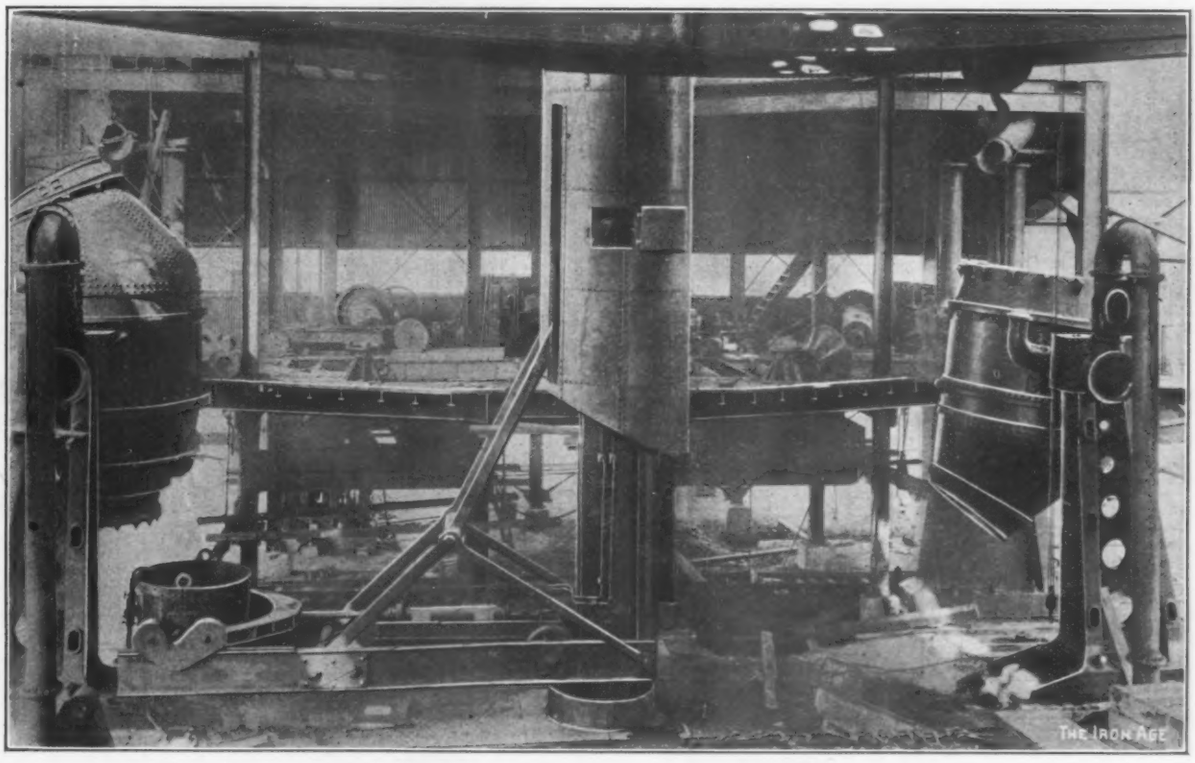


Fig. 1.—View in the Converter House of the Youngstown Sheet & Tube Company, Showing the Two 10-Ton Converters, the Hydraulic Ladle Crane and the Overhead Electric Traveling Crane.

A description of this new Bessemer plant naturally begins with the

Cupola Building.

This building is 52 x 78 ft. and is equipped with four cupolas 10 ft. in diameter and about 20 ft. high, Fig. 4. Blast is furnished by four centrifugal blowers of the Sturtevant type. The cupolas are so arranged that blast can be shut off from any of them or they can all be op-

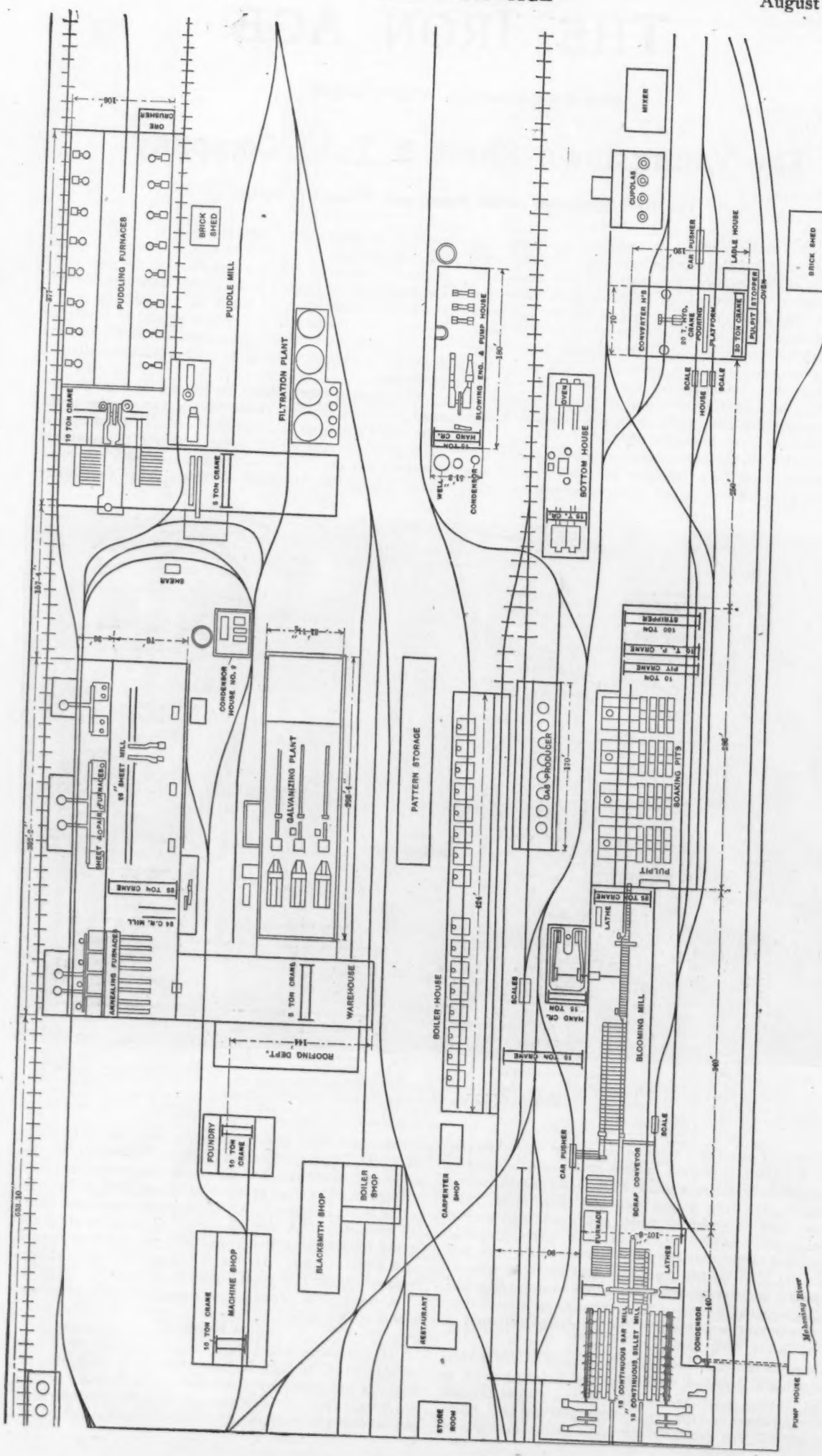


Fig. 2.—Half of the Ground Plan of the Youngstown Sheet & Tube Company's Works.

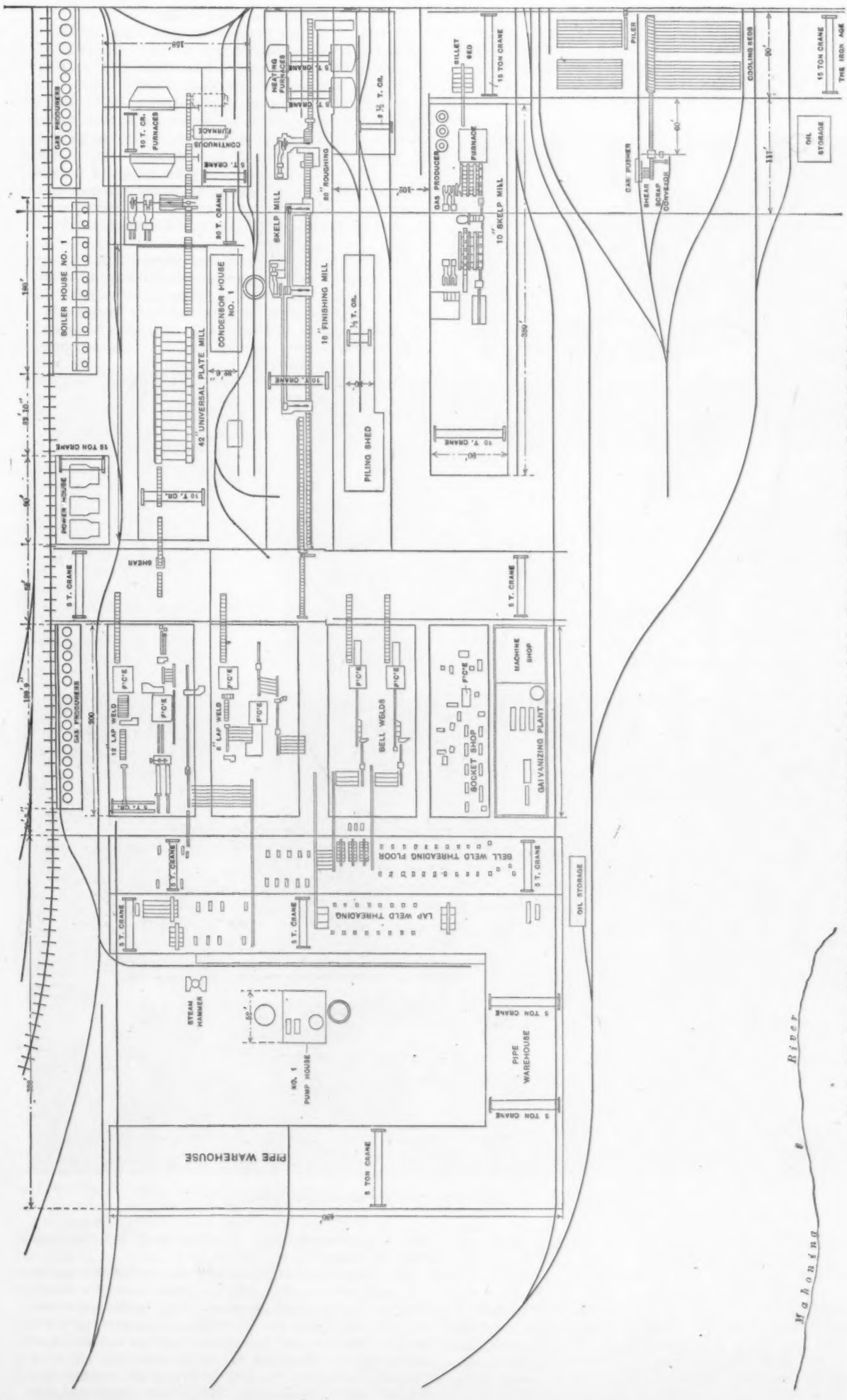


Fig. 3.—The Other Half of the Ground Plan of the Youngstown Sheet & Tube Company's Works, Continued from the Left of Fig. 2.

erated together. The building is equipped with a double hoist for hoisting the pig iron and coke to the cupolas, furnished by the Otis Elevator Company, each hoist having a lifting capacity of 10 tons. These hoists are operated by a 10 x 12 in. Otis engine.

The pig iron and coke are stored under a 20-ft. trestle

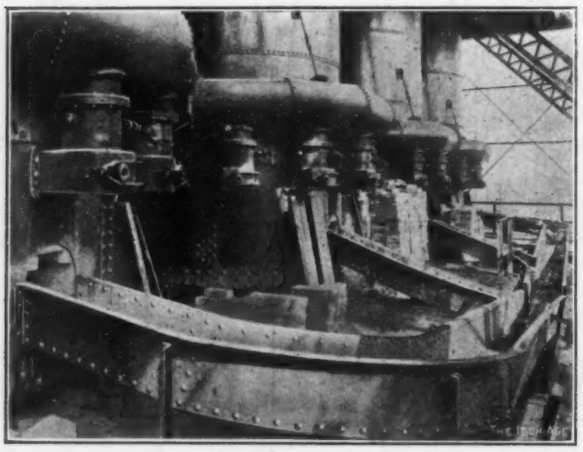


Fig. 4.—Arrangement of Cupolas in the Youngstown Sheet & Tube Company's Bessemer Plant.

located adjacent to the cupola building. A Fairbanks scale is located here, on which all material is weighed before being hoisted to the cupolas. On the charging side of the cupolas is a cinder floor, the cinder being conveyed from the cupolas by chutes through openings in the cinder floor and dropped into cars immediately under and taken away. Above the cinder floor is the tapping floor, on which the blowers are also located for supplying blast for the cupolas. Each blower is directly connected to a Crocker-Wheeler motor of 75 hp. running at 1500 rev. per min. Each pair of cupolas has a runner discharging the molten metal in a ladle car on the track below whence it is taken to the converters. The tapping floor extends from the cupola building to the converter house, and it has a standard gauge track for conveying the hot metal ladle cars to the converters. The hoists are equipped with automatic safety gates, which lower immediately when the platform ascends and descends.

The Converter House

is equipped with two 10-gross-ton converters, as shown in Fig. 1, and is commanded by a 20-ton hydraulic crane designed by Julian Kennedy, Pittsburgh, and built by the Morgan Engineering Company, Alliance, Ohio; also an electric traveling crane of 25 tons' capacity, built by the same company. When the molten metal reaches the converter floor it is weighed on scales directly in front of the converter, into which it is then tapped by an electrically driven tapping device. On the converter floor is located a furnace for preheating ferromanganese and speigeleisen. After the heat is blown the converter is tapped into a ladle, which is carried by a 20-ton ladle crane.

The pouring is done from a platform elevated about 8 ft. above the floor level and extending the entire width of the building. The pouring track is immediately in front of the platform on the converter side. On the other side of the pouring platform is another track to accommodate empty molds returning from the stripping house. The platform for operating the converters is in the rear of the converter building, as shown on the general plan, thus allowing the vessel operators to have a clear view of the entire building. This platform is slightly higher than the level of the vessel floor. Above the converter floor is a second floor to which a hoist conveys scrap to be charged into the converter, scrap being first dumped into hoppers from which chutes convey it to the converters.

The converter building is of most substantial construction, being heavily braced. In line on the platform just outside the converter house are two Fairbanks scales, one for weighing the empty cars and the other for weighing the loaded cars. The ladle house is located in a lean-to adjoining the converter building and is equipped for drying four ladles at one time. Near the ladle house is located the stopper oven for making stoppers for the ladles. The entire equipment for the cupolas and converters was furnished by the William B. Pollock Company, Youngstown.

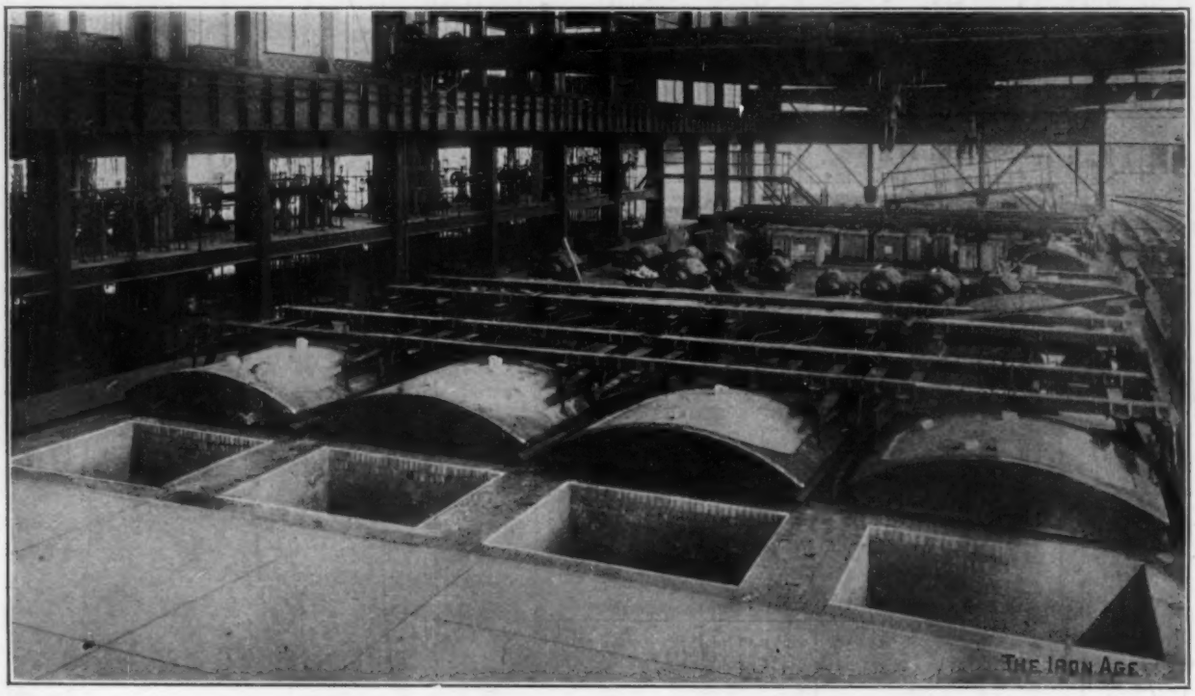


Fig. 5.—Pit Furnaces in the Youngstown Sheet & Tube Company's Bessemer Plant.

The bottom house for making the converter bottoms is a steel building, 50 x 120 ft., commanded by a 15-ton Morgan electric traveling crane. The building contains the necessary equipment for crushing gannister, used for making converter bottoms. The crushing and grinding machinery was furnished by the Thomas Carlin's Sons Company, Allegheny, Pa., and consists of one crusher, one dry pan and two wet pans. There is also a storage bin

between the drying pans and the wet pans. A trestle alongside the bottom house conveys material to the grinding pans. At each end of the building is a lean-to containing a double oven for drying converter bottoms.

The Pit Furnace Building

is 80 x 280 ft. and is equipped with a Morgan electric stripper of 100 tons capacity. This building is in line with the converter building, leaving a distance of 250 ft. between the converter and stripping houses, affording space to be utilized for other purposes. A hot metal mixer may be installed in the near future, when the company adopts the hot metal system for bringing metal from blast furnaces. There are four four-hole pit furnaces, each 7 x 7 ft., as shown in Fig. 5. The covers are operated by hydraulic cylinders in such a manner that as soon as a cover is removed it raises from the floor, thus avoiding unnecessary wear on the cover.

The ingots from the converter building enter the pit furnace building on a track located on the south side of the building, and are charged into the pits by a Morgan 6-ton electric charging crane. After being heated the ingots are taken from the pits by the charger and placed on a tilting car, which conveys them to the blooming mill by means of a rope drive on a track on the north side of the pit furnaces. The arrangement of gas and air valves of the pits is such that each pit furnace can be regulated independently of the others. All the regulating and reversing valves are located in a lean-to on the north side of the pit furnace building.

Arrangements have been made for taking care of the cinder from the furnace pits by means of a tunnel, having a track on which a cinder car runs. The cinder is dropped into the car and conveyed to the end of the tunnel, which opens into a shaft, from which the top can be removed, enabling the box of cinder to be picked up by an electric crane and taken away. The charging crane in the pit furnace building is equipped with a 5-ton auxiliary hoist. The binding of the pit furnaces has been made exceptionally heavy.

On the north side of the pit furnace building is a gas producer building, which contains eight large Duff producers. The gas flues are so arranged that each pair of producers is connected to one pit furnace, thus giving each pit furnace its individual gas producers. Coal for the producers is supplied by an elevated track. The pit furnace building is exceptionally large and most conveniently arranged.

The Blooming Mill

is contained in a building 45 x 360 ft. This mill is of the combination type and can roll slabs up to 30 in. wide. It is shown in Fig. 6. The ingots for this mill will be 20 x 20 and 12 x 30 in., depending upon the kind of material to be rolled. The mill is of the built-up type, designed by Julian Kennedy, and was built by the United Engineering & Foundry Company, Pittsburgh. The diameter of the rolls is 33 in. and the distance from neck to neck 80 in. The screw-down is electric and is operated by a 100-hp. Crocker-Wheeler motor. The manipulator is of the Wellman type, as used for combination blooming and slabbing mills. The main mill tables are operated by two 100-hp. Crocker-Wheeler motors, Cutler-Hammer masters being used. The pinions are 40 in. in diameter and have cut helical teeth. The roll spindles and the couplings are of the Kennedy design, being all steel forgings, thus preventing all back lash in the mill.

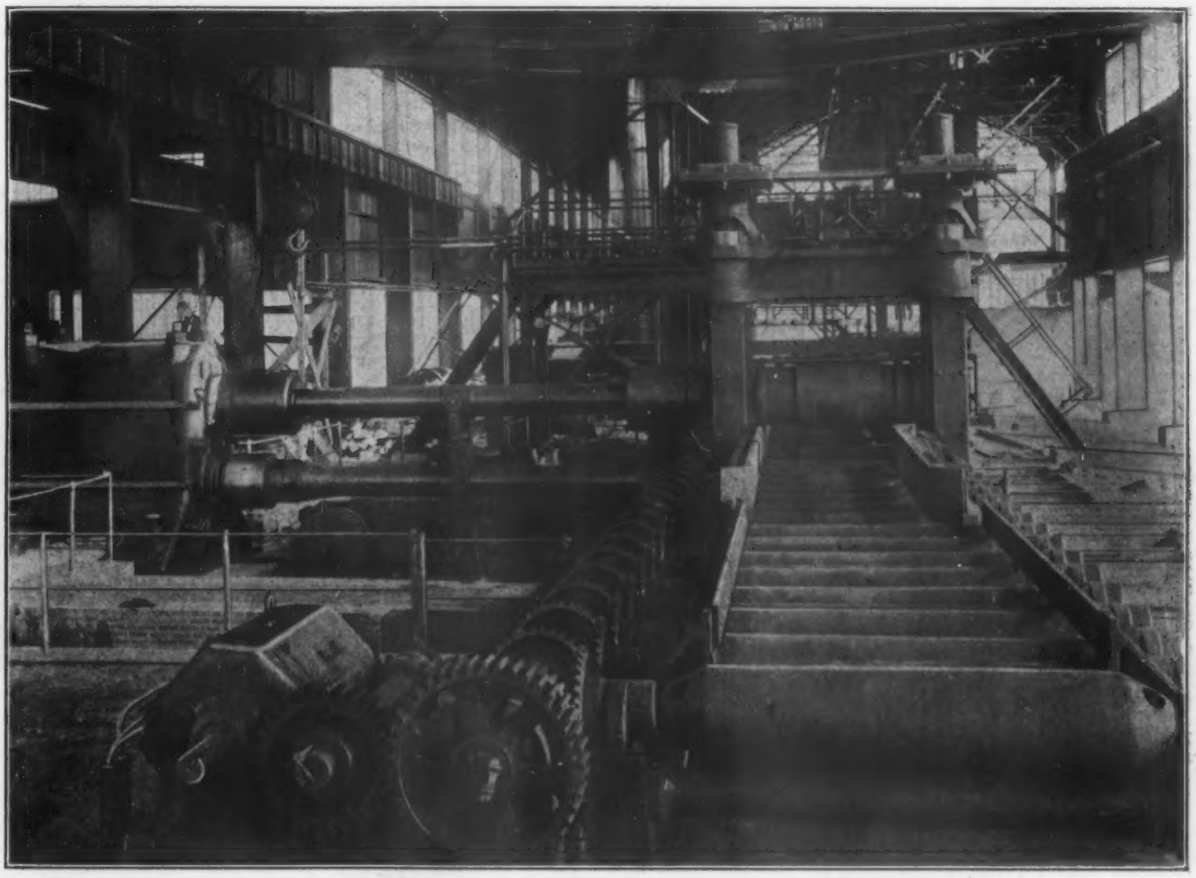


Fig. 6.—The Youngstown Sheet & Tube Company's Blooming Mill.

The engines for driving this mill are of the heavy duty rolling mill type, 54 x 66 in. twin reversing, and are equipped with the Kennedy return crank. The blooming mill is controlled by a 25-ton Morgan electric traveler. The engines are located in a lean-to; also controlled by a 15-ton electric traveling crane.

The main blooming mill tables are 40 ft. long, while the extension tables are 120 ft. long. At the end of the extension tables is an Aiken hydraulic shear, which is used for cropping off ends of blooms intended to be rolled on the continuous mills. If slabs are being rolled for the skelp mill they are run out on the extension tables and transferred about 20 ft. across the building to an electrically driven blooming shear, where they are sheared into proper lengths before being taken to the skelp mill.

This shear was built by the United Engineering & Foundry Company and will cut slabs 30 in. wide by 6 in. thick.

After leaving the shears the slabs are pushed off the back shear table with an electric pusher on the conveyor, which loads them automatically on the narrow gauge cars, after which they can be taken by the overhead electric traveling crane and loaded on broad gauge cars for shipment. The crop ends from the shears are loaded automatically on the narrow gauge cars, after which they are taken to the converter building.

The Continuous Billet and Sheet Bar Mills

were designed by the Morgan Construction Company, Worcester, Mass, and are shown in Fig. 7. The blooms for the continuous mill are rolled to the size of 4¾ x 7½ in. After leaving the hydraulic shears they are taken by a conveyor, which leads directly to the sheet bar train. If intended for the billet mill, the pieces are transferred to another table, which stands directly in front of the billet train. The continuous sheet bar mill contains eight pairs of 18-in. rolls and the continuous billet mill has 10 pairs of 18-in. rolls. In addition to rolling sheet bars the mill is equipped to roll skelp in sizes 7⅞ to 15 in., inclusive. The billet mill will roll a complete range of sizes from 1¾ in. square up to 4 x 4 in.

The billet and sheet bar mills are each equipped with two flying shears of the Edwards type, one shear being placed directly in front of the first pair of rolls and the other some distance beyond the last pair, the first being intended for serving in the capacity of emergency shears, the second shear being intended to cut the bars in 30-ft. lengths after leaving the finishing train. The billet and sheet bar mills are located in a building at the end of the blooming mill, 107 x 120 ft., which is served by a 15-ton Morgan electric traveling crane.

Each mill is driven by a 48 and 84 x 60 in. cross compound Corliss engine built by the Filer & Stowell Company, Milwaukee, Wis. The two engines are equipped with a condensing plant furnished by the Southwark Foundry & Machine Company, Philadelphia.

After the sheet bars are cut into proper lengths they are delivered to a bar piling machine of Kennedy design, located in the billet and sheet bar yard. In the billet and sheet bar yard are located the hot beds where the product of the mill is deposited. After leaving the shears the billets are conveyed to the skew table and are thence transferred to the hot beds. At the end of this hot bed is a cradle on which billets after being cooled are dropped and then taken by a traveling crane and loaded on cars for shipment. The sheet bars intended for shipment are handled in the same manner by overhead cranes.

When 4 x 4 in. billets are rolled and intended to be cut into short lengths, they are run over the skew table to the conveyor, at the end of which is a billet shear of the same capacity as the electrically driven bloom shear, also built by the United Engineering & Foundry Company. This shear is capable of cutting from four to six billets at a time. Ample provision has been made for handling the billets after being sheared. The billet and sheet bar stockyard is 90 x 500 ft. and is controlled by a 15-ton Morgan electric traveling crane.

The entire rolling mill equipment in the continuous mills was built by the Lloyd-Booth Department of the United Engineering & Foundry Company.

The 42-Inch Universal Plate Mill.

Connected with the plant is a 42-in. universal mill built by Mackintosh, Hemphill & Co., Pittsburgh, on which can be rolled plates 42 in. wide, with the vertical rolls in; by removing the vertical rolls plates up to 66 in. wide can be rolled. The mill is equipped with the Farrell hydraulic balancing gear, which is also used for roll changing. The mill is driven by a 44 x 60 in. Mesta twin reversing engine, built by the Mesta Machine Company, Pittsburgh, and the main tables are driven by two 100-hp. Crocker-Wheeler motors. The screw-down for the horizontal rolls and the regulating mechanism of the vertical rolls are electrically driven.

The mill delivers to an extension table the full length of the building, from which table the plates are transferred to a hot bed 120 ft. long for cooling. From this hot bed the plates are taken to the shear table, which is equipped with two rotary shears for trimming the edges of the wide plates. The plates are then conveyed to the pipe mill skelp yard, where they are cropped by another shear. For heating the steel slabs a Laughlin continuous heating furnace is used, and for heating piles for iron skelp two regenerative furnaces are used. These two furnaces are served by a Wellman overhead charging crane. The gear train and engine in the universal mill are controlled by a 30-ton Shaw electric crane.

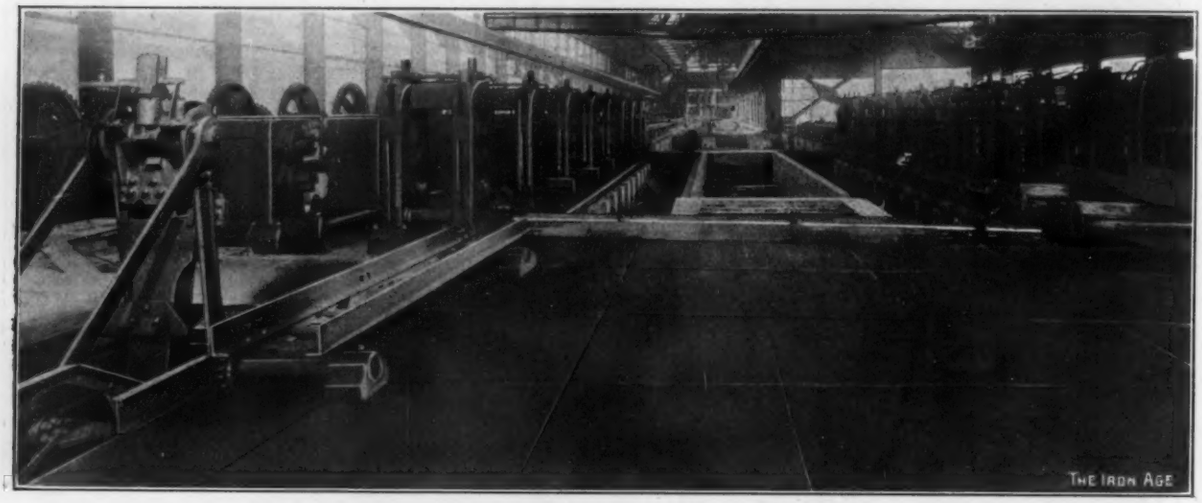


Fig. 7.—The Youngstown Sheet & Tube Company's Continuous Billet and Bar Mills.

The Engines and Boilers.

The blowing engine house is a brick and steel structure 50 x 180 ft., commanded by a 15-ton traveling crane. The building contains one 44 and 84 x 76 x 72 in. cross compound horizontal blowing engine built by the William Tod Company; also two horizontal cross compound duplex pressure pumps, 18 and 36 x 10 and 10 x 36 in. Connected with these pumps and blowing engine is a Weiss condenser built by the Southwark Foundry & Machine Company.

The boiler plant contains 16 Sterling boilers, each 500 hp., erected separately and each having an independent stack 58 in. in diameter and 150 ft. high. The boilers are equipped with Roney stokers and are fed with the Heyl & Patterson electric conveyor. There is also installed one Heyl & Patterson coal crusher and elevator, to be available in case it is necessary to use lump coal.

The Electric Power Plant.

The power plant consists of two 400-kw. Westinghouse generators and one 800 Bullock generator, all of

which are driven by William Tod cross compound engines. It is equipped with a fine white marble switchboard 40 ft. long for distributing current through the different mills.

The electric motors used in the steel plant are of the Crocker-Wheeler type. They were selected after the most careful investigation, and a design of motor has been worked out that it is thought will be thoroughly adapted to the severe service to which motors for driving rolling mill machinery are subjected. While the moving parts are thoroughly inclosed and protected, it is also possible to exchange the armature of the motor in an exceedingly short time. The motors were designed expressly for this mill by O. R. Jones, chief electrician. They were made by the Crocker-Wheeler Company, Ampere, N. J., and were built in four sizes—25, 50, 75 and 100 hp. They are used throughout all the tables of the various mills. The motors have exceedingly large shafts, reducing the spring of the armature to the minimum and the Cutler-Hammer solonoid controller is used.

The mill is located 1200 ft. from the power house, and the current is carried by either of four 1,000,000 circular mill cables on each side and is further distributed through the switchboard by 66 automatic circuit breakers which can be set from a remote part of the mill.

The 10-Inch Skelp Mill.

The company will shortly break ground for a continuous skelp mill for the manufacture of skelp up to 4¼ in. wide. This mill is being designed and will be built by the Morgan Construction Company, Worcester, Mass., and will include all the modern features of a continuous mill. It will be housed in a steel structure 80 x 380 ft., and will be controlled by a 10-ton overhead electric traveling crane. This mill will consist of ten pairs of rolls and will be located south of the present No. 2 skelp mill. The furnace end of the mill will be adjoining the sheet bar stockyard of the new steel plant.

The Plant to Be Self-Contained.

The foregoing description covers quite fully the new mills of the Youngstown Sheet & Tube Company. With the starting of the steel plant the company will be self-contained, making its various lines of products from the ore up to the finished material. It owns large ore properties in the Mesaba and Marquette districts and also a large coal acreage in the Connellsville region. The company has owned the Alice blast furnace at Sharpsville, Pa., for some years and has arranged to take the Bessemer iron output of a number of blast furnaces in the Youngstown District, these being the stacks of the Youngstown Steel Company, the Briar Hill Iron & Coal Company, the Ohio Iron & Steel Company, the Stewart Iron Company and Pickands, Mather & Co. The output of these furnaces, together with the product of its own furnace at Sharpsville, Pa., will give the company a full supply of metal for its new steel plant.

In this connection a description of the older portion of the Youngstown Sheet & Tube Company's works will undoubtedly be of interest. This logically begins with

The Puddling Mill,

which contains 15 double puddling furnaces equipped with Cahall upright boilers and one double puddling furnace without a boiler. The mill is equipped with two 20-in. muck trains, two squeezers and a cooling and transfer arrangement for transferring the finished bar to piling racks on either side of the rolling table. One rack is for ordinary puddled bar made from pig iron and the other is for scrap bar. The transferring machinery in this mill is operated by hydraulic power.

The mill is driven by a cross compound 24 x 42 x 42 in. piston valve, William Tod engine directly connected to the muck rolls and squeezer. The boiler plant has 14 boilers of 150 hp. each and one of 200 hp. There is a broad gauge railroad track midway between the two rows of double furnaces for loading scale and other scrap which accumulates about the mill. The products are handled from the cooling beds to shears by an electric traveling crane. The muck bar is taken from the cooling beds by a traveling crane and transferred to the shears, where it is cut into lengths. This traveling crane has a runway beyond the mill for loading bar on the cars, some muck bar being sold in the open market, but the product of this mill is mainly used in the company's sheet and skelp mills.

The Sheet Mill

is equipped with six stands of hot rolls and two stands of cold rolls and has six heating furnaces, all gas fired. The engine equipment consists of one 24 x 48 x 48 in. cross compound piston valve engine connected by gears to the hot rolls, built by the William Tod Company, Youngstown. The hot rolls are driven by a 13 x 25 x 36 in. direct connected tandem compound piston valve engine of the Buckeye type.

There are four Swindell heating furnaces and five Swindell gas producers. Two producers furnish gas for four annealing furnaces and three producers furnish gas for the heating furnaces. Twenty-one annealing boxes are used of the following sizes: Three are 150 in. long by 5 ft. high by 50 in. wide, five are 108 in. long by 4½ ft. high by 40 in. wide, and the remainder are 123 in. long by 4½ ft. high by 40 in. wide. Additional equipment comprises one scrap shear, three squaring shears and a roll lathe for turning the rolls. An electric crane is used for changing the rolls and handling the products of this mill. The power for charging and drawing the annealing furnaces is furnished by a winding engine.

The iron is stocked in the warehouse when it comes from the annealing furnaces, where it is assorted. All iron from this department which is to be galvanized goes to the galvanizing department, and the black iron goes to the paint shop to be painted. From the galvanizing department and the paint shop the iron required to be corrugated or crimped goes to the corrugating or crimping department and is thence shipped to destination.

The galvanizing department is equipped with three sets of pickling vats, three galvanizing pots and three sets of conveyors for taking the galvanized iron to the storage department. After leaving the acid pots the iron passes between rubber rolls, which partly dry the sheets before entering the galvanizing pots, through which it is then drawn by a set of rollers. Iron on the conveyors is cooled by a large fan with a capacity of 2000 cu. ft. of air per minute. The conveyors are driven by three small steam engines, and at the end of the conveyors the iron is loaded on hand trucks and taken to the scales, weighed and packed in the storage house for shipment.

The paint shop is equipped with a roller paint machine, the sheets passing between the rolls and receiving a coat of paint and from there are conveyed to the drying stalls. When dry, if crimping or corrugating is required, they are transferred to the corrugating department, which is equipped with one corrugating press, one set of corrugating bending rolls, two crimping machines and one coiling machine for coiling sheets when fastened end to end for shipment.

The Skelp Mill

is equipped with a 20-in. roughing train and 16-in. finishing trains. A tandem compound piston valve 22 x 40 x 48 in. William Tod engine is directly connected to the roughing rolls. The finishing rolls, which have three stands, are driven by a tandem compound 22 x 40 x 33 in. William Tod engine, used with a rope drive. The iron goes through all three of these stands, which are arranged tandem, and is then transferred to the shear roller table and is cut in lengths. The mill is equipped with four Siemens heating furnaces for iron and one Laughlin continuous heating furnace for steel. There are eight Laughlin, six Duff and two Morgan gas producers. Two Morgan electric charging cranes take the hot billets from the furnaces to the rolls.

The mill is provided with a set of vertical rolls for reducing the billet edgewise to the size of leading passes in roughing rolls. The irregularity in size of billets necessitates a device of this kind to reduce the larger sizes of billets to one width required for the roughing rolls. The wider sizes when entering without being reduced usually turn down in the rolls and form a cobble or bad bar. All tables are electrically driven. The rolls are operated by a rope drive, the rope drum being driven by a William Tod compound engine. An electric traveling crane runs the entire length of the mill. The skelp mill is

continuous in operation after the bar leaves the roughing rolls.

The Pipe Mills.

No. 1 buttweld department is equipped with one heating surface, with a 7 x 21 ft. working bottom, and draw bench 57 ft. long, and one stand of sizing rolls and one stand of cross rolls. The cooling bed is equipped with two cold saws for sawing cropping ends of pipe as it is being drawn. Skelp for the heating furnace is conveyed to the furnaces by a roller table electrically driven. Charging is done by hand and there is one pair of shears for pointing skelp. The mill is equipped with conveyors to carry pipe from the cooling bed to the threading floor.

No. 2 buttweld department is equipped with one furnace, having a working bottom 22 ft. 5 in. long by 7 ft. 2 in. wide. The furnace is charged by hand, skelp being delivered to furnace by roller table electrically driven. There is a draw bench 40 ft. long delivering the iron to one stand of sizing rolls and one stand of cross rolls. Cooling beds are each provided with cold saws for cropping pipe and it is delivered to the threading floor by roller conveyors. The pipes are welded by being drawn through conical shaped castings.

No. 1 lapweld department is equipped with a bending furnace and a welding furnace. The size of pipe made by this department is from 2 to 8 in. The working bottom for the bending furnace is 20 x 7 ft. The welding furnace has a working bottom 23 ft. 3 in. x 8 ft. This department has one bending charger and one welding charger and one transfer for charging machine. There is also one tumbling barrel for polishing pipe balls driven by a 10-hp. electric motor.

The skelp is brought to the furnaces by a roller table and delivered to the charging table, from which the skelp is put into the furnaces by means of electric machinery. The plate is drawn from the furnace by the sacrificing rolls, passing through the rolls to the table which delivers the scarfing plate to the bending box through which the plate is drawn by means of tongs drawn by a chain which bends the skelp into cylindrical form. It is then transferred to the welding furnace and charged by means of an electric charging machine. After the cylinder attains a welding heat it is pushed into the welding rolls and welded. Then it is transferred to the sizing roll table, passing through the sizing rolls, then through the cross rolls, then to the cooling racks. From the cooling racks it is put through a straightening press and then delivered to the threading floor by a roller conveyor.

No. 2 lapweld department has one bending furnace and one welding furnace. The bending furnace has a working bottom 22 x 8 ft. The welding furnace has a working bottom 25 x 9½ ft. This furnace makes pipe from 4 to 12 in., inclusive.

The skelp is delivered from the skelp yard by an electric crane to the roller table which conveys it to the charging table operated by hydraulic cylinder, the skelp being charged by electric machinery. After it is heated it is put out on a roller table and delivered to the scarfing rolls, and from the scarfing rolls to the bending box and bent into a cylindrical form, then transferred to the welding furnaces by table car haul. The cylinder is then charged and brought to the welding heat, then pushed into the welding rolls. If the pipe has been properly welded it passes to the sizing rolls, and if not it is returned by means of a roller table to the charging end of the furnace and recharged for rewelding. As the pipe is passing through the welding rolls it is forced over a ball the size of the internal diameter of the pipe which is somewhat larger than the finished pipe. It then passes through the sizing rolls, then through the cross rolls and finally to the cooling rack. From the cooling rack it passes through the straightening press and is delivered to the threading floor.

The Threading Floor.

The output of No. 1 buttweld department requires eight threading machines threading pipe from ¼ to 2 in., and there are testing machines working under a pressure of from 1000 to 1500 lb. After the pipe has been threaded it is transferred to the testing machines and tested according to size. It is then transferred from the testing bench to the bundling bench and from the bundling bench to cars. The product of No. 2 buttweld department requires seven pairs of machines taking in from 1 to 3 in. The process is the same as for No. 1.

The product of No. 1 lapweld department requires two rotary cut-off machines with eight pairs of threading machines, taking in sizes from 2 to 8 in., and one tester working under pressure of 1500 to 2500 lb. by means of an intensifier. The pipe is delivered to the cut-off machines, and cut to lengths and is then taken to the pipe threading machines. After the pipe has been threaded it is inspected, then delivered to the socket screwing machines where the socket is automatically screwed on the pipe. The construction of the machine is such as not to distort the shape of the pipe coupling when being screwed on as is the case when it is screwed on in the ordinary manner by pipe tongs. After the coupling has been screwed on it is delivered to the testing bench and tested to a pressure of 1500 to 2500 lb., according to the size of pipe. The welded pipe is delivered from the testing bench to the cars by means of a traveling crane. The No. 2 lapweld department has two rotary shears and nine pairs of threading machines which take in from 4 to 12 in.

The gas for the pipe department is furnished by 12 Laughlin, 3 Morgan and 2 double Duff water seal gas producers. Water for testing purposes is furnished by three pumps, two of which work under a pressure of 2500 lb. and one of 1000 lb. For the higher pressure there is an intensifier used in connection with the testing benches. There are four cranes on the threading floor and three in the warehouse. Between the warehouse and the threading floor at the north end of the floor is a transfer track to deliver the pipe from the threading floor to the warehouse when being stocked, and at the south end of the threading floor is a traveling crane for the same purpose. The warehouse has two electric traveling cranes for loading pipe for shipment. There are three shipping tracks entering the warehouse and two entering the threading floor.

The Socket Shop

is equipped with three welding furnaces, two steam hammers, one of 1200 and one of 600 lb., and two Bradley hammers. There are three bending machines and one roller welding machine, two hot expanders, eight lathes, three six-spindle tapping machines, which tap from ¼ to 1¼ in.; one six-spindle machine, which taps from 1 to 2 in.; two six-spindle machines tapping from 2 to 4 in., two four-spindle machines tapping from 4 to 8 in. and one four-spindle machine tapping from 6 to 14 in. After the iron has been cut to multiple lengths and brought to the heating furnaces and heated to the proper heat for bending it is bent by machinery and then delivered to the welding furnaces. After it attains a welding heat it is welded under the steam hammer on a mandrel, according to the size of the coupling. From the welding hammer the coupling is taken to the expanding machine and extended to the proper size and shape for tapping, then passes to the tapping machines and is tapped. From the tapping machine it goes to the recessing machine and then to the inspector for inspection and sizing.

The Pipe Galvanizing Department

is equipped with three galvanizing pots, one for galvanizing couplings and two for galvanizing pipe from ¼ to 12 in. in diameter. There are three pickling vats 25 ft. long 5 ft. wide and 3 ft. deep. The pipe is delivered to the pickling vats on a car and placed on a rack, the size of which is sufficient for one charge for pickling, after which it is placed on arms, which are lowered into the pickling vat by means of hydraulic power, and remains on those arms a sufficient time to become thoroughly cleaned from scale. Then it is transferred from the pickling vat to the drying oven, and from the drying oven into the galvanizing pot.

The Machine Shop for the Pipe Mill

is equipped with two Cincinnati universal grinders, one 48-in. Betts horizontal boring mill, one 16-in. Prentiss engine lathe, with a 6-ft. bed; one 16-in. Prentiss engine lathe, with a 7-ft. bed; one 24-in. Prentiss engine lathe,

one 30-in. by 11 ft. bed Lodge-Shipley lathe, one 24-in. Hendey-Norton lathe, one 36-in. Barnes drill press, No. 2 Cincinnati universal milling machine, No. 4 Cincinnati plain milling machine, one 24-in. Hendey-Norton pillar shaper, two 18-in. Hendey-Norton shapers, one 6 x 24 American Tool Works planer, one 22-in. Barnes drill press, two pair cut-off saws, one Modern Machine Tool Company's die grinder, one 6 x 10 Ingersoll air compressor, two Whitney tool grinders, two tapping machines, two die hopping machines. The machines are all driven by a 120-hp. Westinghouse electric motor. The size of the machine shop is 60 x 75 ft.

The Foundry and Shops.

The foundry building is 60 x 80 ft. at present, but will be enlarged. The equipment consists of one No. 6 Whiting cupola of a capacity of 14 tons an hour; one No. 6 Green rotary blower, electrically driven, directly connected; one core oven, 8 x 20 ft., and one 10-ton electric traveling crane. The foundry is equipped for making castings up to 10 tons.

At present the blacksmith shop has 13 forges; two steam hammers, one 3000-lb. and one 800-lb.; two cranes for handling iron from hammers, one Bradley hammer, one fan with a capacity of 14,600 cu. ft. per hour, one heating furnace, and one small tempering furnace.

The boiler shop is equipped with one punch and shear capable of punching 1¼-in. holes in 1-in. plate, and will shear 1-in. plate and is electrically driven. There are also bending rolls capable of bending a plate 1 in. thick and 10 ft. long, or wide to the radius of 24 in.; pneumatic riveting machine, pneumatic clipping machine, pneumatic drilling machine, one forge fire, one flange fire and a scraping plate.

The pattern shop has the following equipment: One 34-in. Clement band saw, one 16-in. Clement hand jointer, rip saws and cross-cut saws, 24-in. lathe, No. 3 Oliver trimmer, two No. 4 Fox trimmers, grindstone and emery grinders, glue heating and steam heating system. The size of the shop is 26 x 80 ft., with a side wing of 16 x 18 ft. This shop is to be removed from its present location and enlarged in the near future.

The pattern storage building is two stories high and measures 80 x 90 ft., but it is proposed to build an addition, 50 x 200 ft. The building is entirely fireproof.

The machine shop is equipped with one Bullard boring mill, one 4 x 16 ft. planer, one 3 x 9 ft. planer, two radial drill presses, one 24-in. shaper, one 48 in. 14 ft. lathe, one 36-in. lathe 20-ft. centers, one 24-in. Pond lathe 14-ft. centers, one 24-in. lathe 12-ft. centers, combination key seater and slotter, small drill press, one 3-in. bolt cutter, one 2-in. bolt cutter, one 250-ton wheel press, one 30-in. lathe, one Yankee drill grinder for grinding drills, one 24-in. water emery wheel, one double bracket dry emery wheel. It is equipped with a Buffalo air heater, which is used in the summer for cooling the shop. Power is furnished by a 10 x 14 in. engine. The building is now 75 x 80 ft., and is to be extended 40 ft.

Condenser and Water Plant.

Condenser house No. 1 is equipped with two duplex compound pressure pumps manufactured by Epping-Carpenter Company, 18 x 30 x 8½ x 24 in., one Worthington surface condenser, two boiler feeds, both same size and duplex, 12 x 8 x 16 in., manufactured by Epping-Carpenter Company.

Condenser house No. 2 is equipped with Epping-Carpenter condensers having a cooling surface of 4000 sq. ft., two boiler feeds and an Epping-Carpenter duplex pump 12 x 8 x 16 in.

The pump house contains two duplex compound tank pumps, both manufactured by Epping-Carpenter Company, 12 x 22 x 18 x 24 in.; one centrifugal pump, suction 18 in. discharge 18 in., manufactured by Henry R. Worthington; one tank pump, manufactured by the Deane Steam Pump Company, 17 x 24 x 17½ x 24 in.

A water filtering plant of the capacity of 15,000 hp. is being built for filtering feed water for the boilers. The We-fu-go water softening and purifying plant is to be used. It is manufactured by the William Scaife & Sons Company, Pittsburgh.

The Officers.

The offices of the Youngstown Sheet & Tube Company are located in the Federal Building, Youngstown, Ohio, the officials being as follows: James A. Campbell, president; H. G. Dalton, vice-president; George E. Day, secretary and general manager of sales; Richard Garlick, treasurer; W. E. Manning, assistant manager of sales; W. C. Reilly, general superintendent, and A. L. Hammerberg, chief engineer.

Specifications for Steel Rails.

The subject of steel rail specifications, the discussion of which was adjourned from the meeting of the American Society of Civil Engineers in January, 1906, came before the convention of this society at the Frontenac Hotel in the Thousand Islands in the last week in June. It developed that little progress had been made by the committee since its report in January. Eight members of the committee signed this report, while each of the other four members presented a minority report. The whole subject was referred back to the committee with the request that it present a report at the next annual meeting in which it was hoped that all the members of the committee might concur. The original report of the committee was summarized in *The Iron Age* of February 1, 1906, page 424. When this report was submitted in January the committee asked to be discharged, seeing that it could not agree. The matter is now in practically the same shape in the American Society of Civil Engineers as in the American Society for Testing Materials, though the points of disagreement between the members of the respective committees are quite different. It is interesting to note that the American Railway Engineering and Maintenance of Way Association has adopted the specification originally presented by the majority of the American Society of Civil Engineers' committee, with a few modifications. At present the outlook for a unanimous report by either of the two committees referred to above is not encouraging, and there is less prospect for harmonizing the specifications of the two organizations as represented in the majority reports of their respective committees.

The *Engineering News*, referring to the disagreements in the committee of the American Society for Testing Materials, says: "In that case the only matter at issue was specifications for manufacture and test; rail sections were not discussed, the standard sections of the American Society of Civil Engineers (designed and adopted in 1893) being accepted as standards. Wholly different grounds are responsible for the failure of the American Society of Civil Engineers' committee to agree. Two of the dissenting minority members hold that the standard rail sections should be modified. The other two suggest their belief that modifications of the standard forms of section are advisable, but consider that no change can be made before much fuller investigation of the service value of the present sections is obtained. Their dissent from the majority report is based mainly on various requirements of the specifications for manufacturing methods and processes and not, strange to say, on the specifications for testing the finished rails. Apart from the question of form of rail section the disagreement in the committees of the two societies is therefore due essentially to rather antithetic views: The opposition in the American Society for Testing Materials holds out for more rigid tests, believing that rigid control of the manufacturing processes is not sufficient, while the opposition in the American Society of Civil Engineers demands more rigid limitation of the rolling mill methods and chemical requirements, apparently on the theory that it is not sufficient to prescribe rigid tests. An exceptional phase of the situation in the latter society's committee is that one of the dissenting members, Percival Roberts, Jr. (formerly of Pencoyd Iron Works, Pencoyd, Pa.), recommends adding a test for tensile strength and elongation (the test piece to be taken from the railhead), and also would fix a limit of allowable deflection in the drop test of finished rails, both of which are rather novel proposals."

A Scotch Shipbuilding Record.

GLASGOW, July 28.—The first half of the commercial year 1906 has been a record one for Scotland. It has witnessed the production of an amount of tonnage from the Scotch shipyards unprecedented in the history of shipbuilding in any part of the world. In these six months our shipyards put into the water no less than 360,489 tons in 207 vessels of all sizes. No other shipbuilding country ever came up to such a total in six months. Few countries come up to it in 12 months. Even in Scotland the nearest previous approach to it was 259,804 tons in the first six months of 1902.

The Clyde proportion of this huge total was 149 vessels and 336,258 tons. This enormous output from the Clyde yards has undoubtedly been augmented by the launches of the Lusitania, the Cunard steamer of 32,500 tons, and of the Agamemnon, a battleship of 16,500 tons, in the closing weeks of the half year. But even if the tonnage of these two exceptional vessels was deducted the output would still have been enormous. We are, as a matter of fact, now witnessing the fruition of the boom of contracts which marked the close of last year.

The Lusitania is not the only monster merchant craft we have put into the water of late. In June, for instance, D. & W. Henderson & Co. launched a 9000-ton steamer for the Holt Line of Liverpool; Scott's Shipbuilding & Engineering Company, Greenock, launched an 8000-ton steamer for the Canadian service of the Donaldson Line; Wm. Denny & Bros., Dumbarton, launched a 7000-ton steamer for the New Zealand Shipping Company's frozen meat trade; Barclay, Curle & Co. launched a 5600-ton steamer for the Ellerman Lines, Limited, of Liverpool.

Apart from these liners the great feature of the closing weeks of the half year has been the launching of large numbers of the big cargo tramps ordered during the shipbuilding boom. These range from 8000 tons downward, and it is questionable where they will all find profitable employment. That does not concern us perhaps, who are more interested in the industrial work of the production of iron and steel vessels than in the commercial employment of them. But as regards the industrial aspect there is this to be considered—that by the amount of new tonnage put afloat is the amount of work on hand reduced.

This is not an exact mathematical statement of the position, because some new orders have been booked as the old orders are filled, but the new orders are far short of the launches. For example, against 123,070 tons launched from the Scotch yards in June, of course an exceptional and unprecedented total, the new contracts booked in June cannot exceed about 15,000 tons. This necessarily means that the shipyards will not be so busy in the near future as they have been in the recent past. Yet it is also to be noted that there is still a good deal of work on old contracts, as apart from new bookings to be executed, so that we shall remain fairly active for the remainder of the year.

Apropos of the building on the Clyde of the huge battleship Agamemnon, which when completed will be the most heavily armed warship in the world, it is worth noting what we can now do in this line. The Agamemnon was built in the new yard of W. Beardmore & Co., Limited, the latest constructed and most perfectly equipped shipyard in the world, because it has in equipment been able to select the best plant demonstrated by the experience of others. In this latest and most modern shipyard not a pound of steam is used. Everything is electrically driven, and the electric power is generated by the aid of a gas engine operated by gas from producers on the premises, which gas is also used to fire the plate and bar furnaces. At its steel works the firm also makes armor plates, and it is contemplating an extensive ordnance establishment at which gun mountings as well as guns are to be produced. Thus it will possess a complete naval construction establishment, in which will be produced almost everything necessary to equip a warship from keel to armament.

B. T.

Steel Hardening Metals in 1905.

WASHINGTON, D. C., July 30, 1906.—There was a decline in the total production of steel hardening metal ores and concentrates in 1905, as compared with 1904, but the value of the output, nevertheless, shows a material increase, according to the annual report of the United State Geological Survey, which has just been completed by Joseph H. Pratt. Under the head of steel hardening metals are included all the metals that are used for steel hardening purposes, whether or not this is the main use of the metal.

During 1905 the total production of steel hardening metal ores and concentrate amounted to 922 net tons, valued at $288,836, as compared with 1004 tons, valued at $259,620 in 1904, a decrease of 82 tons in quantity, but an increase of $29,216 in value. Of the 1905 value, over nine-tenths was due to the production of tungsten ores.

During the last ten years the main supply of nickel and cobalt produced in the United States has been obtained from Mine La Motte, Mo., as a by-product in lead smelting. Besides this there have been small quantities of nickel ore obtained from Idaho, Oregon and North Carolina. During 1905, however, there was no actual production of any metallic nickel or cobalt oxide, and there was only a very small quantity of nickel and cobalt ore reported sold.

All of the chromium ore produced in the United States during 1905 was from California, but amounted to only 25 tons, valued at $375, as compared with the production of 123 tons, valued at $1845, in 1904.

There was a considerable increase in the production of tungsten ore during 1905, as compared with that of 1904, and also a general increase in the price paid per ton for the concentrates containing from 60 per cent. and over of tungstic oxide. There was, however, considerable variation in the price, which in the early part of the year brought $400 per net ton for a 65-per cent. concentrate. About July 1 the price was approximately $6 per unit, and still later in the year the price was $5.50 per unit. These prices, however, varied more or less with the location of the deposit. The total production of tungsten ore during 1905 was approximately 18,851 net tons, from which there was obtained 803 tons of concentrates, valued at $268,676. Most of the hubnerite was obtained from Arizona, the wolframite from Colorado and South Dakota, and the scheelite from California and Montana. Besides this production there were two or three tons of tungsten ore and concentrates shipped as a sample run of ore from claims near Deer Trail, Stevens County, Washington.

During 1905 the production of molybdenite and of wulfenite was obtained from Arizona and Montana, the total being in excess of the 1904 production of 14½ net tons, valued at $2175. The value of the molybdenum ores varies from $230 to $430 per ton, according to the contents.

The production of the ores of uranium and vanadium during 1905 amounted to approximately 4 tons, valued at $750, and was obtained from Colorado and Utah. This ore as shipped contained 3.06 per cent. uranium oxide. There was, however, considerable ore mined which was not concentrated at all, but was stored waiting the erection of concentrating mills. The total tonnage of ore taken out, as reported to the survey, is 2081 net tons.

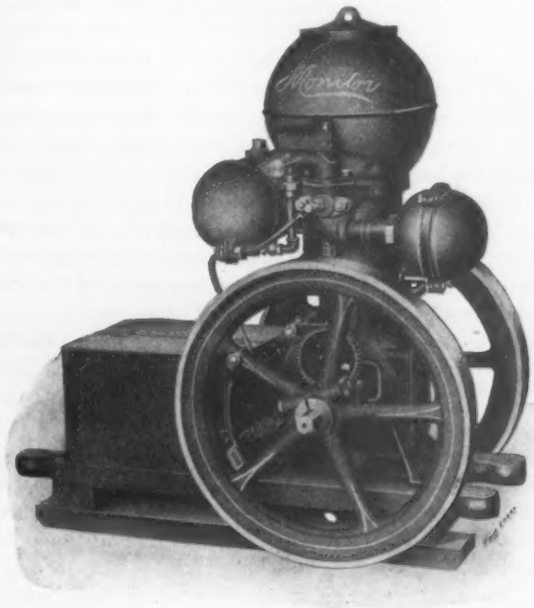
The production of titanium was entirely from Roselands, Nelson County, Va. The production in 1905 was somewhat larger than that of 1904. On account of the rather small demand for this metal, there can readily be an over-production of the rutile, which is often the case at the Virginia mines and necessitates the closing down of the plant for a number of months during the year.

W. L. C.

The London branch office of the Buffalo Forge Company and Buffalo Steam Pump Company has been changed from 39 Victoria street, East, to Caxton House, Westminster. This change has been made necessary by the constant and rapid growth of the company's business in Great Britain. The new offices afford additional space and are more conveniently located.

The Monitor Gasoline Engine.

The principal feature of the new line of small engines built in 2, 4 and 6 hp. sizes by the Baker Mfg. Company, Evansville, Wis., is the cooling system, which is claimed to overcome the difficulties of running the engine in freezing weather. The water jacket is extended above the cylinder and the end enlarged into a spherical shaped tank which holds 2 gal. per horsepower. As the engine runs, this water is heated until it boils and the excess heat is dissipated in the steam liberated. It is not necessary to provide for circulation, as the water is abundantly agitated by the boiling action. The temperature of the cylinder cannot materially increase above 212 degrees, which is not too warm for perfect lubrication of the piston. When the run is finished the water remaining around the cylinder can be drawn off, leaving the jacket empty and safe from freezing. The boiling away of 1 lb. of water after it has reached the boiling point requires seven times as much heat as to raise it to the boiling point. Hence the water disappears from the water tank very slowly. One filling of the cooling tank will last five hours when the engine is running at full load, and many times as long when the engine is lightly loaded.



The Monitor Gasoline Engine, Built by the Baker Mfg. Company, Evansville, Wis.

It is the contention of this company that air cooled engines are unsatisfactory for steady runs at full loads, being wasteful in both gasoline and lubricating oil, because the cylinder temperature reaches too high a point, as a consequence of which it is impossible to lubricate the cylinder properly, and the excessive friction absorbs power, rapidly wearing the cylinder.

The company is also prepared to furnish engines with a water jacket cap for sealing the top of the water jacket in place of the spherical water tank. With this construction a galvanized iron cooling tank of any capacity may be set by the side of the engine and connected with the water jacket by circulating pipes in the usual manner for water cooled engines. When the engine is used exclusively for pumping, the tank is dispensed with and the cooling water taken from the discharge of the pump, a small portion being sufficient for the cooling. The drainage of the discharge will drain the engine jacket and prevent freezing.

The Monitor engines are adapted to run with either No. 1 distillate, naphtha or gasoline as fuel. The fuel is carried in a heavy cast iron tank on the side of the engine cylinder and is drawn up from the tank to the throttle by the suction of the piston. This method of introducing fuel does away with the fuel pump, with its leaky glands, valves and piping. It also mechanically atomizes the fuel and makes it possible to start the engine in zero weather without difficulty. It is emphasized that this arrangement is not to be confounded with a gravity system, as the fuel in the tank is always lower than the outlet, and therefore cannot possibly flood should the engine be stopped by overload or otherwise. When it is desired to place the fuel supply tank out of doors a fuel pump is furnished with the engine.

The engine operates on the four-cycle principle and has a governor of the "hit and miss" type. The governor weight is placed well out in the flywheel, where it moves very rapidly and acts directly on the detent and not through a set of sliding collars. It is also hung so that the friction of the hinge pin is practically eliminated. This feature makes it impossible for it to gum up or stick in cold weather, and renders it sensitive to small changes in load. Ignition is by the jump spark method, as used on most automobiles, sparks being made only on the strokes which draw in a charge. According to the company's tests the jump spark ignition is more economical than the make-and-break arrangement.

Lubricating of the engine is from a sight feed oil cup, which feeds oil to the piston. After lubricating the piston the oil drips down into the base, where it is splashed upon the connecting rod bearings and all sides of the piston. This lubricates the working parts and gives the operator only one oil cup to fill. The shaft turns in Babbitt lined bearings, and the malleable iron connecting rod has phosphor bronze bearings at both ends, the crank end being made adjustable for wear. The crank shafts are drop forged steel, the piston pins are hardened and ground, and the cams, cam rollers, cam roller pins and detent points are hardened. The pistons are provided with three packing rings accurately fitted.

The engine is one convenient to mount on portable wagons for use in different locations. Where it is desirable the two larger sizes of the engine may be equipped with friction clutch pulleys. These are extremely simple in design and reliable, never requiring adjustment to take up wear. An engine equipped with one of these pulleys may be started with the load off and after the engine is up to speed the load may be gradually put on. The friction clutch pulleys are bolted to the spokes of the flywheel the same as the plain pulleys.

The Lake Superior Mining Institute.—The twelfth annual meeting of the Lake Superior Mining Institute will be held in the copper country August 8 to 10, 1906, headquarters being at the Douglas House, Houghton, Mich. The first excursion train will leave Houghton at 1.45 p.m. Wednesday, August 8, for Calumet. Papers for the meeting, of which the secretary is advised thus far are the following: "The Geology of Keweenaw Point—A Brief Description," by Alfred C. Lane, State Geologist, Lansing, Mich; "Mine Sanitation," by Dr. B. W. Jones, Vulcan, Mich.; "Five Years of Lake Superior Progress," by J. F. Jackson, Houghton, Mich.; "The Iron Ore Deposits of the Ely Trough, Vermillion Range, Minnesota," by C. E. Abbott, Hazel Green, Wis.

The International Railroad Master Blacksmiths' Association will hold its fourteenth annual convention at the Sherman House, Chicago, August 21-23. The following is a list of the subjects to be discussed: "Frogs and Crossings," "Best Method of Flue Welding and Flue Used," "Classification of Work in Shop," "Tools and Formers for Bulldozers, Steam Hammers and Forging Machines;" "Discipline and How to Obtain the Best Results in a Railroad Blacksmith Shop," "Case Hardening Methods," "Time Taken and Specimens of Work Furnished and Kind of Material Used," "Best Methods of Annealing and Tempering High Speed Steel," "Best Coal for Use in Smith Shop and Kind of Fires Used," "Piece Work *vs.* Day Work," "Making of Locomotive Frames from Scrap to Finish; also Repairing, How Many Broken During the Year, How Often Broken in Same Place," and "Thermit Welding." A. L. Woodworth, Lima, Ohio, is secretary and treasurer of the association.

An Iron Ore Scarcity Is Not to Be Feared.

Considerations Which Should Modify the Alarmist Tone of Some Recent Comment.

BY JOHN BIRKINBINE, PHILADELPHIA.

Exhaustion of the iron ore reserves of the world has been the subject of recent discussion, instigated by addresses or papers by men whose business or professional experience or whose official positions give weight to their opinions. Most of these contributions have been pessimistic in tone and some have been accepted in part as alarming, for the general tenor has been that if the world continues to demand increased quantities of iron ores the metal will become too scarce, and as a consequence too costly for general application. The rapid pace set by the users of iron ores, when measured by the records of two decades, may excite wonder as to where the future producers of iron and steel will find raw materials to meet the ever increasing industrial output, and it is not surprising that this should suggest prophecies of exhaustion of iron ore supplies, a condition summarized by the late Prof. N. S. Shaler as follows:

> Finally, it may be some centuries from now, but surely we shall be forced to an economy in the use of metal such as was exercised by folk 200 years ago, when save for what went down at sea or rusted back to earth none of it was lost to the arts. In this stage, when it becomes again a precious metal, iron may continue to be the helper of man for an indefinite period, but its power for help will be greatly diminished.

The writer believes that the utilization of scrap at the present time prevents a larger percentage of the iron produced being "lost to the arts" than was the case two centuries ago, and he doubts that iron will ever become a precious metal.

Present Conditions of Use May Change.

The prophecies of exhaustion of iron ore depend for their fulfillment on a practical continuance of existing conditions, such as the relative location of iron ore producing mines, iron ore consuming plants, coal deposits and coke ovens, moderate changes in labor conditions; on labor saving or transportation facilities ceasing to improve; on manufacturing and industrial centers being mainly limited to those now recognized; on little if any progress in the metallurgical processes. Moreover, such prophecies omit the possibilities of other metals or alloys being produced at a cost competing with iron at or near present prices.

Had the ironmaster of half a century ago been informed that in 50 years the production of iron would reach the quantities now annually made, and had he believed this otherwise possible, he would have prophesied that sufficient ore could not be found to produce such an enormous output, and he would have expressed doubt as to the possibility of obtaining fuel to smelt the ores or of assembling these at blast furnaces.

Are we not in prognosticating a shortage of iron ore viewing the future with comparatively as little knowledge as the ironmaster of 1856? Naturally each contributor to the discussion views the problem from his country's standpoint. But any estimate of mineral reserve must assume that the whole world has been explored for the specific mineral indicated. Railroads and steam vessels are now absent from few of the geographical or political divisions of the earth, and where other slower or more exhausting means of transportation must be employed the explorer and scientist have not been deterred in their work. But dare we assume, with the present knowledge of geological and physical features, that it is possible to approximate the mineral value of the earth's crust? Little of this has been studied in sufficient detail to place reliable estimates of quantities; in fact, few sections known to contain mineral can be considered as having their reserves demonstrated, as necessity for such demonstration has been wanting.

Too Much Stress on Location and High Iron Content.

But if the estimator of iron ore admits this he may quote further from Professor Shaler in the *International Quarterly:*

> The cost of production will gradually increase as the lower grade ores and those remote from coal come into use. In the end we shall have to resort to concentrating processes by which the iron ore is separated from the rock in which it is disseminated as grains. This upward grade in cost means a downward grade in the utility of the metal in the service of man.

It is well known that some iron ore deposits are removed from present or immediately prospective transportation facilities or distant from fuel, are lean and must be beneficiated. But when we remember how iron ores of the Lake Superior region have been the incentive to gridiron that section with railroads and to build an enormous inland marine, equipped with loading and unloading facilities second to none, distance becomes comparatively unimportant where ores are conveyed by boat for less than a mill per ton-mile, and where long railroad hauls can be provided at 3 mills per ton-mile. Under such circumstances ores can be carried to fuels or fuels to ores, or the two can meet at desirable points at costs which need not be prohibitive.

The liberal use of Swedish, Spanish, African and other foreign ores by European and American furnaces and the large proportion of the ore supply of the United States coming from the Lake Superior region illustrate how transportation facilities affect the locality of supply. So in beneficiating, modern mining methods, economies in mechanical appliances, &c., permit lean ores to be mined, roasted, comminuted or separated at small cost. In the existing stage of mining and mechanical development, and with the study which has been devoted to labor saving appliances, transportation facilities, methods of beneficiating ores, &c., the leanness of ores and present distances from points of consumption are not to be given too much importance.

Local Ores as a Factor.

The convenience of using ores rich in iron and the facilities for obtaining such material by purchase as wanted have encouraged the transportation of desirable mineral over long distances to furnaces close to which relatively inferior ores lie unused. The freight added to the selling price of these more desirable ores in some instances brings the cost of producing pig metal above what may be expected by using relatively inferior local ores. Iron ores from Minnesota reach Eastern blast furnaces with freight charges representing a cost of 4 cents or more per unit of metal, to which must be added the selling price of the ore, commissions, &c., and interest charges for winter storage. Four cents per unit will go a long way toward mining or beneficiating some ores convenient to blast furnaces which are generally overlooked in estimating reserves. These local deposits may have been wrought by methods in which labor saving appliances were not included, and a use of such methods

may materially alter mining conditions. Dividing interest on capital, superintendence, management and fixed charges by a few hundred tons output per annum is quite different from using thousands of tons as a divisor. Many dormant deposits do not encourage the expectation of large reserves; others give indications that the deposits may prove important factors in the future ore supply.

Estimates of the World's Supply.

Some of the papers which discuss the iron ore reserves differentiate these on the basis of present blast furnace practice. Thus in the estimates made by Professor Törnebohm for the Swedish Government, he credits Great Britain with as much as he allots to the United States and Germany with double that quantity of iron ore for future use; but for the United States he assumes a yield of from 45 to 67 per cent., for Sweden 50 to 70 per cent., for Great Britain 25 to 40 per cent. and for Germany 30 to 45 per cent. In other words, the estimated 1,100,000,000 tons for the United States is all treated as of a grade superior to the richest of the British or German mineral.

"The world's total supply of iron ore now known, which he gives as 10,000,000,000 tons, will be exhausted in about 50 years. If the total be correct about one-quarter of the world's known reserves have been used to the present time," says Chas. K. Leith,* who in referring to the above estimates states that by multiplying the figures of the average percentages of metallic iron given for each of the countries by Professor Törnebohm, the result is as follows:

	Tons of metallic iron.
United States	603,166,600
Great Britain	295,000,000
Germany	825,000,000
Spain	249,375,000
Russia and Finland	637,500,000
Sweden	611,538,460

Germany is thus given pre-eminence, and Russia and Finland, Sweden and the United States are placed next in order, followed by Great Britain and Spain.

With an abundance of high grade iron ore available American blast furnace managers cannot be expected to prefer lean ores, but they are not so exacting as to discard mineral carrying less than 45 per cent. of iron, and furnaces are now operating in the United States whose average ore charge will not yield that amount. In the early days of mining in the Lake Superior region only the cream of the mineral was sent to consumers, but in later years the average iron content of ore shipped has been lower than in former times. The favor with which blast furnace managers received rich iron ores from the Lake Superior region, mined for them and delivered to them without any responsibility other than ordering in time and approving bills, naturally encouraged the sale of the best of the ores, and the decline in average yield, reported in *The Iron Age* as 0.92 per cent. in four years, is not to be credited to depletion of resources, for, as the editorial states, a very large part of the 15,000,000 tons increase in annual output, comparing 1905 with 1901, came from new mines.

American Ore Reserves Underestimated.

Crediting Professor Törnebohm with superior knowledge of European ore deposits, and also of those from Asia and Africa, which have been drawn upon, his presentation of the problem may be discussed from the American standpoint. The estimated reserves allotted to the United States, 1,100,000,000 tons, are less than have been commonly credited to the Lake Superior iron ore region alone. One estimate given currency in the past year puts the total for this district above 1,500,000,000 tons.

* *Economic Geology*, Vol. I, No. 4. February-March, 1906.

Professor Törnebohm's figures for the United States are made up of 1,000,000,000 tons for the Lake Superior region, 60,000,000 tons for Alabama brown hematites (this omits any consideration of the red hematite deposits), with 40,000,000 tons left to complete the total of the unmined ores in New York, New Jersey, Pennsylvania, in all the Southern States (except the brown hematite mentioned) and the ores of all Western States, including Wyoming.

Mr. Leith says that "Professor Törnebohm's estimate of the total reserves of iron ores for the United States is very conservative and probably should be greatly increased. His estimate is confined to the producing districts and leaves out of account many important extensions of the ore deposits and districts, many known deposits of good size and quality not now mined because of location or other causes and large reserves of ore which in the United States are regarded as too low grade to be of present commercial value, but really of a higher grade than ore counted in the English and German reserves."

Mr. Leith adds that current estimates pointing to a short life for iron ore reserves are low, and for the United States do not take low grade ores sufficiently into account; that these low grade ores must be soon counted as a part of the reserves; also that the increased use of low grade ores, which this situation seems to call for, will cause economic changes in matters related to the iron ore industry.

The Home Outlook Improves on Investigation.

The writer had unusual facilities, representing the United States Geological Survey for 17 years, to be posted as to the iron ore reserves of the United States, but he has hesitated to offer estimates on these because the more the subject is studied the more favorable the outlook for the future appears.

If Professor Törnebohm's estimate of the United States is incorrect we may question the estimates for other portions of the world outside of Europe. The Swedish professor credits his own country with ores of high metallic contents and with ore reserves equal to those of Great Britain, twice as great as for Spain, nearly as much as for the United States, two-thirds as large as for either Russia and Finland, or for France. This may be accepted as due to a more intimate knowledge of the enormous deposits of his own country and not to a desire to minimize those of other lands. If his total of 10,000,000,000 tons is accepted as representing the ore reserves of the world his apportionment of these must also be accepted, which is as follows:

	Per cent.
Germany	22
France	15
Russia and Finland	15
United States	11
Great Britain	10
Sweden	10
Spain	5
All other countries, including Austria-Hungary	12

On this basis Europe possesses more than three-fourths of the iron ore reserves of the world.

Swedish Official Estimates Quite too Low.

The difference in labor and transportation costs in the various countries or districts will permit those where these items are relatively low using lean ore at a profit. But if necessary the United States could utilize mineral closely approximating the yields of iron mentioned as employed in Great Britain and Germany, and on this basis Professor Törnebohm could revise his United States estimates and largely augment them. He is certainly not optimistic concerning this country, nor do his figures

apparently recognize the known deposits of iron ore in Newfoundland, Canada, Mexico, Cuba or South America. He makes small allowance for Asia, with known iron ore deposits in China, Japan, India and in the Pacific Islands. Nor does he give sufficient credit to the geological reports of Australasia, nor allow for ore reported as existing in quantity in the great continent of Africa.

Of his total reserves 7,700,000,000 tons are given to Europe, 1,100,000,000 tons to the United States and but 1,200,000,000 tons to Austria-Hungary, all of Asia, Africa, Australasia, the Pacific Islands, Cuba, South America and North America, outside of the United States. If the estimates are treated as covering reserves of exploited regions only, calculations may be subject to large allowance, as some data of United States deposits may demonstrate.

How the Known Lake Supplies Have Grown.

For nearly a score of years a part of the Marquette range, Michigan, was believed to mark the productive limits of what is now the Lake Superior region, and this range, opened in the year 1854, has shipped a total of 77,000,000 tons of iron ore. But in 1877 the Menominee range to the south became a factor and has supplied 53,500,000 tons. Then followed the Gogebic range (in a region expected to produce copper rather than iron), which since the year 1884 has forwarded a total of 47,000,000 tons.

In Minnesota the railroad which in 1884 opened to traffic the Vermillion iron ore district (which has produced over 23,500,000 tons) climbed the range in which eight years later the phenomenal Mesaba deposits were exploited. This last range has supplied 99,000,000 tons of ore, and is believed to have greater known ore reserves than all the other ranges combined. In all but one, and possibly in all of these ranges, new finds of importance are reported or extensions of the ore bodies are demonstrated. In addition, deposits have been developed in the Baraboo district of Wisconsin and on the Michipicoten and Atikokan ranges in Canada.

Probably nowhere else has there been such systematic and careful prospecting as in the iron ore region of Lake Superior to determine the apparent reserves, but it is doubtful if any who from the results of this prospecting have formulated intelligent estimates of the ore reserves would be willing to say that there is practically no other ore than what he has included.

Other Districts in the United States.

The mines in the neighborhood of Port Henry, N. Y., have been producing iron ore for over a century, but within a short time the known reserves have been enormously increased by discoveries of bodies previously unsuspected.

The Cornwall ore hills in Pennsylvania have been much reduced in size by yielding 19,000,000 tons of iron ore, but it is hardly conceivable that the great "outburst" is not continued under the adjacent mountain.

In New Jersey some of the older mines which were abandoned have been reopened and are contributing to the nation's supply.

In the Alabama-Tenessee-Georgia region and elsewhere new discoveries of ore are recorded, and estimates of reserves suggest quantities far in advance of those credited in the papers discussed.

In Wyoming an unsuccessful venture to mine and smelt copper ore developed an iron ore deposit now supplying the Colorado Fuel & Iron Company 500,000 tons of ore per annum, with reserves of at least a score of millions of tons "known" to be available, and intermediate or nearby territory yet to be explored. The shipment of 100,000 tons of iron ore from the Mesaba range in Minnesota to Colorado in 1905 to make up a temporary deficiency in a special grade of ore (due to opening new workings in Wyoming) was accepted as an indication that these Wyoming deposits were failing. On the contrary, developments demonstrated greater quantities than had been previously expected. Gossip is apt to interpret any such temporary diversion of ore supply to exhaustion of the deposit indicated, whereas the reverse may be the case. Further, it is hardly fair to include all ore deposits of the West as "uncertain," when the Wyoming deposit, supplemented by another in New Mexico, supplies the works of the Colorado Fuel & Iron Company, whose annual capacity closely approximates the annual product of iron in the whole of Sweden.

To these instances of apparent future supplies from sources now wrought are to be added the probable yield of known deposits which await transportation facilities or the power drills, steam shovels and modern equipment of the ore producers in this country and in other lands. When in addition allowance is made for the "unknown," estimates of reserves become more generous.

Evolution in the Use of Ores.

If we are to estimate the iron ore reserves for future use we must also consider their utilization in the future, a utilization which we have no right to assume will be kept within the limits of present industrial development or transportation facilities, nor even confined to prevalent methods of metal production. They are also to be estimated in their relation to the coal reserves if the metallurgical processes of the present are to be followed. Such consideration may make available some ore deposits which are now remote from commercial centers or distant from exploited coal fields.

Up to 1840 charcoal was the approved blast furnace fuel; subsequently bituminous and anthracite coal were used, and now coke is pre-eminently accepted as the fuel for blast furnaces. Disintegration, washing and jigging of coal and improved methods of coking have brought within the list of coking coals some which were formerly outside of this class and others may be expected to respond to similar treatment, so that if "the ore travels to the fuel" new iron producing centers may be anticipated. Unless we assume that there are to be no further advances in this particular the utilization of various coal deposits and of iron ores convenient to them is to be anticipated.

The practicability of electric smelting of iron ore, which has been the subject of detailed study and report, may be of importance in the future, especially in the treatment of ores whose composition or physical condition is in the present status of knowledge undesirable for use in the blast furnace, and experiments with iron sands by the United States Geological Survey offer a possible reserve of iron ore of considerable importance. The same resource, ability and skill which have brought the iron and steel industry to its present status may be counted upon to overcome most of the objections to ores which are impure or distant, and with new metallurgical methods some ores now avoided because of certain elements in their composition may be in demand.

Moreover, to base calculations of future iron and steel consumption on the late past may not be equitable, for although in buildings, in ships and in other structural work iron and steel largely displace wood or masonry, and the uses to which the metal is applied are multiplying, the specifications for strength and the study given to design combine to reduce the unit in weight of such substitution.

The Importance of the Inquiry.

The writer fully appreciates the importance of a frank study of resources and the folly of wasteful use of them, especially such as are not reproduced. He also is satisfied that his record as an investigator of deposits of iron ore and his reports upon industries remove him from the class of optimists who expect every indication of ore to develop into a great mine, or that each locality where ore and fuel can be assembled will be the seat of a prospective industrial center.

The papers and discussions upon the probable exhaustion of iron ore supplies have served a good purpose in awakening interest in a subject of importance to all who produce, manufacture or use iron or steel. One result to be anticipated is that known deposits of iron ore classed as undesirable by reason of location, apparent volume, physical structure or chemical composition may receive consideration; that some now unopened may be exploited and others which have been wrought in the past may re-enter the list of producers, while encouragement to develop new sources of iron ore may come from the discussion.

The fact that a number of ores considered unattractive by blast furnace managers can be made available has received more limited attention than would have been given had the better ores been more troublesome to obtain. But roasting pyritiferous ores has been followed for many years; more complete desulphurization and the nodulizing of comminuted sulphurous ores is practiced on a commercial scale; a large tonnage of magnetite is passed through magnetic separators to reduce the silica or phosphorus contents; and practical demonstration has shown that titaniferous iron ore when properly fluxed can be economically smelted. The field for such beneficiating and treatment is large and promises a considerable addition to the iron ore reserves.

The problem is to be studied from the standpoints of deposits now exploited, of those unwrought, but concerning which ideas of their extent and character have been formulated by exploratory work, and of those whose locations are made known by prospecting, with allowances for probable iron ore supplies suggested by geological conditions.

The United States by its phenomenal production of iron and steel and incident liberal use of iron ores has invited attention to the depletion of a mineral found in every State of the Union, and present in neighboring countries in volume such as to encourage faith in the future of iron manufacture on this continent. If the study of the iron ore reserves is undertaken in connection with present or possible fuel supplies, with consideration of prospective producing and consuming centers, the time when iron may be a "precious metal" or the available supply of iron ore become exhausted may be found so far in the future as to allay any anxiety.

A corrugated steel railroad tie patented by Preston T. Large, North Tonawanda, N. Y., consists of a horizontal base or plate, with a vertical web projecting upward along its central line, the web being corrugated horizontally the length of the tie. A section through the base and the web has in general the form of an inverted T. Near each end of the tie an 8 x 8 in. horizontal tie plate having a corrugated web extending downward and fitting into the corrugations of the web of the tie carries the rail. The tie plate web and the web of the tie are bolted together. The base of the tie and a considerable part of the vertical web are imbedded in the ballast, giving the tie stability. At the same time the corrugations of the web and the tie plate are calculated to give elasticity.

Canada's Supply of Pig Iron.

TORONTO, July 21, 1906.—In the 11 months ending with May, Canada's imports of pig iron amounted to 51,371 tons from the United States and 27,514 tons from Great Britain. These figures make it manifest that the home supply does not fall so far short of the requirements of foundries, as some evidence before the Tariff Commission would make it appear. It is quite evident that the total imports would not go far to provide material for the tonnage turned out from Canadian foundries, as the business of these has been swelling in volume every year of the last decade. The complaint of an inadequate supply came from the Maritime Provinces chiefly, it being alleged in one memorandum presented to the Tariff Commission that the two furnace companies in Nova Scotia were turning their pig iron output to account in works of their own, that it was nearly all manufactured into steel, and that there was practically no foundry iron obtainable from domestic sources.

It cannot be long, at all events, before the discrepancy between the country's present blast furnace market output and the country's consumption will be far greater than what the last year's imports of pig iron indicate. For everything to whose production the foundry industry contributes there is an expanding demand. Manufacturing works that are being brought into existence by the activity in railroad enterprise, the numerous new electrical power developments, the increased acreage on which farm implements and machinery are to be used, the mining revival, the unprecedented building boom—these and other causes that might be specified are making more business for the foundries as well as for manufacturers of steel.

Take the cluster of interests of which the Canadian General Electric Company, the Canada Foundry Company, the Canadian Shipbuilding Company, the Ontario Electrical Development Company, &c., are the chief members. That group of closely associated industries consumes a large tonnage of foundry iron in one form or another. It has practically decided to build a blast furnace on the Niagara River to provide for its own pig iron requirements. Conspicuous in that group is William Mackenzie, the chief proprietor of the Canadian Northern Railroad. He and his partner, Mr. Mann, have an interest which is probably a controlling one in the Atikokan Iron Company that is putting up a blast furnace at Port Arthur. This furnace was originally intended for the production of foundry iron, but there seems a possibility that it may be made part of a steel plant. If a stiff duty were imposed on agricultural implements in place of the present 20 and 25 per cent. ad valorem rates, and if similar increases were made in the duty on all products into which castings enter, the foundry capacity of this country would at once have cause for great expansion, and such expansion would give an impulse to blast furnace enterprise, which has so long been stationary in Canada. C. A. C. J.

The convention of smoke inspectors and representatives of health departments in various cities recently held at Detroit appointed a committee to draft by-laws and to secure information regarding smoke ordinances and regulations in various cities. This will be presented at the next meeting of the association to be held in Milwaukee in June, 1907. Both American and Canadian cities were represented at the convention. John Fairgrieve of Detroit was elected president and Charles Poethke, Milwaukee, vice-president. The Committee on Ways and Means consists of John Shubart, Chicago; John Krause, Cleveland, and Mr. Gilman, Rochester, N. Y.

The compilation of the Technolexicon, which the Society of German Engineers undertook about four years ago, under the direction of Dr. Hubert Jansen, Berlin, is nearing completion, and printing will begin early in 1907. Publication will be in English, German and French. About 2000 firms and individuals have collaborated in the enterprise and over 3,000,000 word cards have been collected.

An Innovation in Roundhouse Heating.

The roundhouse of the Missouri, Kansas & Texas Railway at Parsons, Kan., being located in a region where natural gas is abundant, it was decided that for its heating gas would be cheaper and more desirable as fuel than coal. In designing the heating plant two alternative plans were considered, one being the use of an ordinary fan system heater, with steam coils and low pressure gas fired boilers, and the other the use of a gas furnace and direct air heater. The latter system was found to be the cheaper in cost of installation.

The relative cost of operation would depend largely on the type of the direct heat furnace used. A report on a series of tests read by Jay M. Whitham before the American Society of Mechanical Engineers, December, 1905, shows that the efficiency of gas fired boilers seldom exceeds 65 to 70 per cent., largely due to the excessive amount of air for dilution. At first thought it would seem that the efficiency of the direct heat furnace would be even lower, since it is necessary to maintain a much lower furnace temperature, but the plans for this work submitted by the Buffalo Forge Company, Buffalo, N. Y., provided for an efficiency of 90 per cent. at full capacity, with a maximum furnace temperature not exceeding 1200 degrees and a minimum temperature of waste gases of about 400 degrees. The advantages were so apparent that it was decided to install a direct furnace system and the plant is now in successful operation.

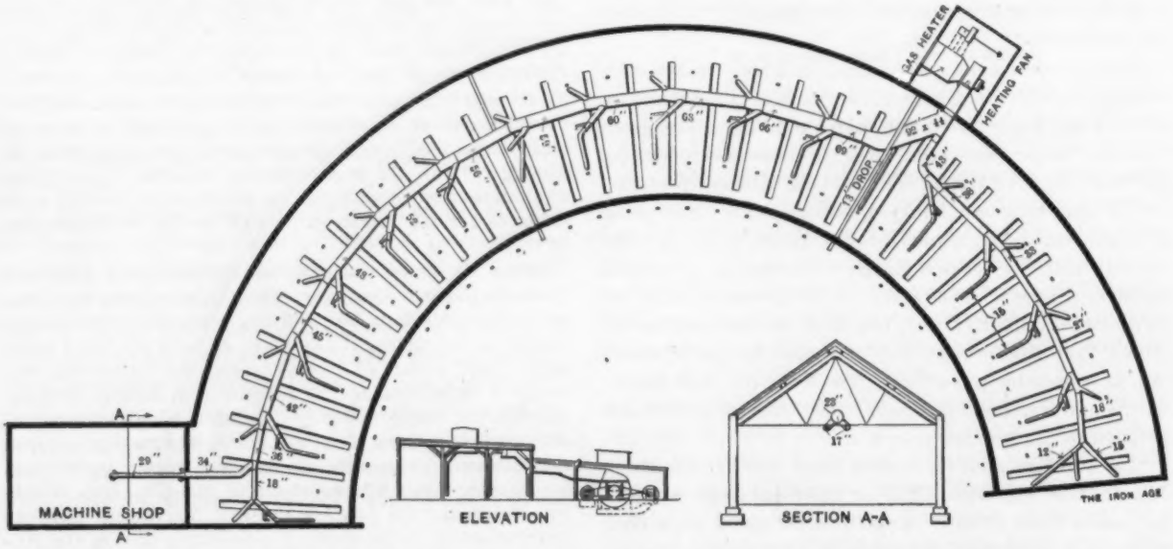


Fig. 1.—Plan of the Roundhouse of the Missouri, Kansas & Texas Railway at Parsons, Kan., Showing the Piping for Heating and Ventilating.

The arrangement of the system is shown in Fig. 1 and details of the apparatus in Fig. 2. The latter comprises a bank of vertical 4-in. boiler tubes expanded at the top and bottom into wrought iron boiler plates. The space beneath the tubes is below the floor line and is divided into two compartments. The first, A, contains the furnace proper, where the gas is burned under special conditions described later. The other compartment, C, is simply an exhaust chamber for the waste gases. Above the tubes is located a single chamber, B, which has a removable sectional cover to allow for cleaning and inspecting the tubes. The gases pass upward through the tubes from chamber A to chamber B, then downward through the tubes to chamber C. At D is an exhaust fan which handles the waste gases. The bank of tubes is inclosed at the top, bottom and two sides, and the current of air for heating purposes is drawn through by the motor driven steel plate exhauster G. From this fan the air, heated to about 170 degrees, is distributed through galvanized iron ducts in the usual manner.

The most important feature of this apparatus is the novel design of burner, which enables the paradoxical result of a high efficiency with a low furnace temperature to be obtained. The gas is burned in fire brick combustion chambers at high temperature with very small excess of air, and is then mixed with a larger volume of the recirculated products of combustion at the relatively low temperature of about 400 degrees; giving a resultant temperature not exceeding 1200 degrees. As will be seen from the end section in Fig. 2, there are four fire brick combustion chambers fed by 16 gas mixers. The combustion chambers are about 9 in. wide and extend the length of the furnace. Each chamber is supported upon a double slotted cast iron burner. The interiors of the combustion chambers are fire brick checker work, which, becoming incandescent, provides for the complete combustion of the mixture of gas and air before it leaves the chamber. The cooled products of combustion drawn into the exhaust fan D are partly discharged through the small vertical stack E, but the greater portion is returned to the chamber F under the burners. The returned gases pass up between the combustion chambers and are mixed thoroughly with the hot products of combustion by the cast iron baffle plates, arranged as shown in the end section, Fig. 2. Since the combustion has been completed within the combustion chambers it is unaffected by the subsequent dilution with the cooler gases.

The gas mixers used in this furnace are of special construction, advantage being taken of the fact that a direct gas pressure of 40 lb. is available. The mixers, however, are designed to work successfully with pressures from 10 to 20 lb. This type of burner differs from the ordinary burner in that it requires a mixture of gas and air containing more than sufficient air for perfect combustion, while the ordinary burner uses a mixture of gas and air containing an excess of gas, the complete combustion being secured by introducing additional air into the furnace to feed the flame. Difficulties attend burning a mixture containing the full quantity of air, since unless the velocity of gas through the burner openings is sufficiently high the flame will strike back; also unless the combustion takes place in an incandescent chamber the flame is very easily put out. On this account it was necessary to design a mixer, or, as it may be more properly termed, a gas injector, which would supply a relatively large volume of air under considerable pressure to the burner proper. This is satisfactorily accomplished by the compound nozzle shown in Fig. 3. A test was made upon this burner and nozzle, in which a mixture of gas and air was supplied to the burner at somewhat over ½-in. water pressure. It was found that when the air ports in the mixer were so adjusted that the flames would just disappear at the top of the fire brick checker work the combustion was practically perfect. Several analyses of the burned gases showed from 1 to 2 per cent. of oxygen and as low as 0.5 per cent. While the theoretical temperature of such combustion would be between 5000 and 6000 degrees F., probably only little

more than one-half of this is attained in the combustion chamber because the thin fire brick walls are surrounded by the exhaust gases at relatively low temperature and high velocities. Owing to the construction of the combustion chambers this radiating surface is quite large, giving a rapid cooling effect. All portions of the cast iron burner are outside of the combustion chamber except the top, which is amply protected by fire brick.

As this furnace is internally fired all radiation is utilized and the efficiency is practically that which would be calculated theoretically from furnace temperatures. As 9 cu. ft. of air and 1 cu. ft. of gas are required for the production of 1000 B.t.u. there will be lost approximately 60 B.t.u., with waste gases at 400 degrees, out of every 1000 B.t.u. produced, corresponding to an efficiency of 94 per cent.

In the Parsons roundhouse, which contains 32 stalls and a machine shop, approximately 8,000,000 B.t.u. per hour are required for heating to 65 degrees in zero weather. With the above type of gas fired furnace a fuel equivalent of approximately 9,000,000 B.t.u. per hour would be required, while with a steam heating plant using gas fired boilers a fuel equivalent of about 12,000,000 B.t.u. per hour would be required. Under average temperature conditions it may be estimated that about one-half of the above heating values will be required; hence the gas fired furnace will give a maximum economy of 3,000,000 B.t.u. per hour over the steam heating plant, and an average saving of 1,500,000 B.t.u. per hour, which is equivalent to approximately 1500 ft. of gas per hour. This at 12 cents per 1000 ft. means a saving of 18 cents per hour, or $3.60 per day of 24 hr. In addition to this there is a great saving in labor and attendance. The yearly saving may thus be estimated at not less than $400, which is 8 per cent. on the cost of the plant. In actual operation, however, the saving would be even greater than this, as the efficiency of a boiler plant drops very rapidly when operated below its rated capacity, owing to the fact that the radiation and stack losses are practically constant at all loads, while the percentage of stack losses in a gas fired furnace decreases at the lower capacities, due to the lowering of the stack temperature.

It is interesting to note the claim that where natural gas is not available a gas furnace heating system may be operated quite as economically as a steam heating system. The average gas producer using soft coal has an efficiency of from 65 to 70 per cent. The combined efficiency of gas producer and gas heater would then be from 59 to 63 per cent., while the average boiler, giving a maximum efficiency of about 65 per cent. at full capacity, would give under the variable requirements of a heating plant only from 50 to 55 per cent., which leaves a considerable margin in favor of using a gas fired furnace for heating in plants where steam is not used as a motive power.

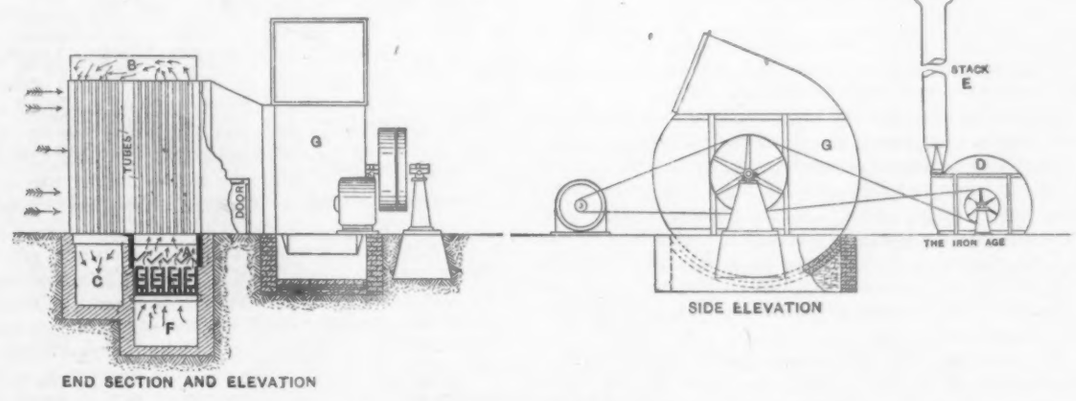


Fig. 2.—Details of the Apparatus, Including Fans and Gas Furnace.

Fig. 3.—The Compound Gas Nozzle or Injector.

The Gayley Dry Blast in Great Britain.—Guest, Keen & Nettlefolds, Limited, have placed an order for an air refrigerating plant to be erected at their Dowlais Iron Works, Cardiff, Wales, and to be in operation in nine months. This will be the first installation in Great Britain to employ the Gayley dry blast process. There will be two 400-ton machines and about 200,000 lin. ft. of pipe will be required in the refrigerating chambers. To each machine there are two horizontal double acting compressors. The steam engines are horizontal and of the cross compound type. The ammonia condensers are designed for the use of sea water as a cooling agent.

The rail output of the Algoma Steel Company at Sault Ste. Marie, Ont., for the year ending June 30, 1906, was 160,000 tons. For the month of June the record was 15,000 tons.

The New South African Customs Tariff.

Seldom has a change in tariff aroused so much discussion in the United Kingdom as has the new South African Customs Union convention, which was agreed to by the various colonies of South Africa at Pietermaritzburg, Natal. The text of the convention, which went into effect May 25, 1906, was received here recently, and is of such great interest, especially to American exporters of manufatcures of metals, that a detailed analysis of those items which may properly interest our readers is here presented, showing the old duty American goods had to pay the old British preferential duty and the new duties on goods both of American and of British origin. It will be, however, of great interest to consider broadly the differences between the two tariffs before a detailed analysis would be duly appreciated. The following diagram will show the skeletons of both the old and the new tariffs:

The Old Tariff.

Class V. General ad valorem rate (applicable to all goods not specially mentioned in the tariff).

a. If the product of the United Kingdom or British colonies granting similar preference to South Africa ..... 7½ per cent.

b. From all other countries.....10 per cent.

Class IV. Free goods, including many metals and manufactures of metals.

Class III. 2½ ad valorem (if of British origin, duty free), including certain classes of machinery, mining and railroad supplies. (Nothing to correspond in the old tariff with Class III in the new tariff.)

Class II. Mixed ad valorem rates. (British goods enjoy a rebate of one-fourth of the duty.)

Class I. Specific rates. (No preference to British goods.)

The New Tariff.

Class VI. General ad valorem rate (applicable to all goods not specially mentioned in the tariff).

a. If the product of the United Kingdom or British colonies granting similar preference to South Africa .....12 per cent.

b. From all other countries.....15 per cent.

Class V. Free goods (corresponds with Class IV in the old tariff). (Very much cut down, most metals and manufactures of metals as well as agricultural machinery now dutiable.)

Class IV. 3 per cent. ad valorem (if of British origin, duty free). (Contains many articles formerly on the free list, which will remain on the free list as far as British goods are concerned.)

Class III. 25 per cent. ad valorem (if of British origin, 22 per cent. ad valorem). (Of no interest to manufacturers of metal wares or to exporters of metals.)

Class II. Mixed ad valorem rates. (Heavy increases of duties. British goods enjoy a preference of 3 per cent. ad valorem only.)

Class I. Specific rates. (Increases of duty, special preferences in many cases to British goods.)

In further analysis it may be said that a heavy protective duty is charged on all articles which are even to a small degree manufactured in South Africa; for instance, on boots and shoes, on carriages and carts, on saddlery and harness. Many articles, like agricultural machinery, certain classes of hardware, metal wares, castings, &c., formerly on the free list, will continue to come in free if the product of the United Kingdom, and will be saddled with a small but annoying duty of 3 per cent. if or American origin.

The general rate, the actual basis of the tariff, is raised from 10 to 15 per cent. on goods of non-British origin, and from 7½ to 12 per cent. on goods of British origin. The rebate in favor of British goods is altered from one-quarter of the amount of duty to 3 per cent. of the value of the article. Specific rebates are granted where none formerly existed; for instance, on cement and blasting compounds.

The new customs tariff contained also a joker which has already resulted in extreme annoyance not only to South African business men, but also to British and American firms doing business with South Africa. A new duty on advertising matter, amounting to 25 per cent., or 4 cents per pound, whichever be higher, was held to apply to catalogues and circulars mailed to individual firms. The result was that many South African firms, rather than pay 4 cents on single copies of unsolicited catalogues, refuse to receive them. Indications are not wanting, however, that from the storm of protest this regulation will arouse in a country so dependent on the oversea trade it will be modified, if not repealed. In the meanwhile it would be wise not to send catalogues or circulars broadcast to the South African trade.

The reception of the tariff in Great Britain was not exceedingly enthusiastic. The appreciation of various new rebates was not unmixed with dissatisfaction because of all around increases. Cape Colony and Natal have welcomed the tariff, because of the expected favorable effect upon the local industries. The Transvaal and Orange River colonies, however, are exceedingly bitter in their denunciation of the new tariff, for one of its immediate effects will be an increased cost of living and of all imported articles.

Following is a comparison of the new and old tariffs:

	New tariff.		Old tariff.	
	Non-British.	British.	Non-British.	British.
Anchors and chain cables.	15 %	12%	Free.	Free.
Bolts, nuts and rivets....	3 %	Free.	2½ %	Free.
Iron and steel, rough, galvanized, corrugated, angle bars, channels, &c.	3 %	Free.	Free.	Free.
Brass and copper, unwrought	3 %	Free.	Free.	Free.
Lead	3 %	Free.	Free.	Free.
Furniture springs.....	3 %	Free.	Free.	Free.
Tin and zinc.....	3 %	Free.	Free.	Free.
Wire and wire netting...	3 %	Free.	2½ %	Free.
All other metals in bars, blocks, ingots.....	3 %	Free.	Free.	Free.
Agricultural machinery and implements	3 %	Free.	Free.	Free.
Asbestos packing.....	3 %	Free.	2½ %	Free.
Assay apparatus.....	3 %	Free.	2½ %	Free.
Belting	3 %	Free.	2½ %	Free.
Hauling chains.....	3 %	Free.	2½ %	Free.
Metal chimneys, cranes, elevators, shears, crucibles, cupolas	3 %	Free.	2½ %	Free.
Fire escapes and appliances	3 %	Free.	2½ %	Free.
Jacks, screw and hydraulic	3 %	Free.	2½ %	Free.
Mining buckets, skips, trucks	3 %	Free.	2½ %	Free.
Piping, water meters.....	3 %	Free.	2½ %	Free.
Wool, hay, straw, forage presses	3 %	Free.	Free.	Free.
Printing machines and supplies	3 %	Free.	Free.	Free.
Tanks and vats.....	3 %	Free.	Free.	Free.
Traction engines.....	3 %	Free.	Free.	Free.
Wire rope.....	3 %	Free.	2½ %	Free.
Bricks, except bath.....	25 %	22 %	10 %	7½ %
Cement	31 cents per 100 pounds.	24 cents per 100 pounds.	10 %	7½ %
Roofing slates.....	3 %	Free.	10 %	7½ %
Blasting compounds.....	5 cents per lb.	4 cents per lb.	3 cents per lb.	3 cents per lb.
Gunpowder	12 cents per lb. + 15 %	12 cents per lb. + 12 %	12 cents per lb. + 10 %	12 cents per lb. + 7½ %
Single barrel guns.....	$5 per barrel + 15 %	$5 per barrel + 12 %	$5 per barrel + 10 %	$5 per barrel + 7½ %
Double barrel guns.....	$3.75 per barrel + 15 %	$3.75 per barrel + 12 %	$3.75 per barrel + 10 %	$3.75 per barrel + 7½ %
Pistols and revolvers...	$1.25 ea. + 15 %	$1.25 ea. + 12 %	$1.25 ea. + 10 %	$1.25 ea. + 7½ %
Carbonic acid gas.....	3 %	Free.	10 %	7½ %
Mineral oil.....	2 cents per imp. gallon.	2 cents per imp. gallon.	10 %	7½ %
Tallow	Free.	Free.	10 %	7½ %
Paper in bulk (not including blotting paper)....	3 %	Free.	Free.	Free.
Carriages, carts, coaches, wagons and parts.....	25 %	22 %	12½ %	9½ %
Cycles	15 %	12 %	12½ %	9½ %
Hubs, rims, spokes.....	3 %	Free.	12½ %	9½ %
Motor vehicles.....	15 %	12 %	12½ %	9½ %
Railroad and tramway material	3 %	Free.	2½ %	Free.
Springs, axles, steps.....	3 %	Free.	10 %	7½ %
Emery cloth in bulk.....	3 %	Free.	10 %	7½ %
Launches, tugs, lighters...	3 %	Free.	2½ %	Free.

Drawback on Hack Saws.—The Treasury Department has extended its regulations of June 29, 1903, in so far as applicable to cover the exportation of hack saws manufactured by the Diamond Saw & Stamping Works, Buffalo, N. Y. In liquidation, the weight of the imported steel which may be taken as the basis for allowance of drawback may equal the quantity consumed as declared in the drawback entry, but in no case shall it exceed the net weight of the exported saws, officially verified, with an allowance for wastage added thereto not to exceed 13 per cent. of the exported weight.

Wrought Iron vs. Steel Pipe.

An interesting contribution to literature dealing with the comparative durability of steel and wrought iron pipe in service is made by the Reading Iron Company, Reading, Pa., in a 12-page pamphlet entitled "Wrought Iron Pipe *vs.* Steel Pipe." The company says that it is consuming the output of 118 double, equivalent to 236 single, puddling furnaces of a total annual capacity of approximately 170,000 tons of puddled bars, all of its wrought iron pipe, tubing, casing and line pipe being made of puddled iron. On the title page of the pamphlet are two illustrations, one of a badly corroded piece of steel casing which had been exposed to the elements from 1897 to 1905, or eight years, and the other of a piece of wrought iron casing similarly exposed in a dealer's stock yard for 10 years longer, or from 1887 to 1905, and which showed practically no corrosion except for the rusting of the threads. Neither piece was in the ground or in the water, and neither had been subjected to any chemical test. From the supply agent of a large coal mining company a statement is printed referring to tests made by placing iron and steel pipe in a mine drain, where they were left for two months, with sulphur water passing through them. The steel pipe was so badly corroded on the bottom where the water passed through that it was thin as paper, while the iron pipe, though badly corroded, retained almost its original thickness. From the discussions in engineering societies on the wearing properties of steel and wrought iron in various lines of service, quotations are made indicating a preference for iron under certain conditions of use. We make the following extracts from the argument for puddled iron pipe, as presented by the company itself:

The Manufacture of Steel Pipe.

"The manufacture of welded steel pipe on a commercial scale was begun about 20 years ago. At first some difficulty was experienced in welding, but improvements were gradually made, so that most of the low carbon steel manufactured now can readily be welded. Another objection to steel pipe when first introduced was that the average fitters had considerable trouble in threading it with their own dies, but as steel pipe could be purchased for less money many fitters would put up with this trouble in threading for the sake of cheapness, while the more conservative ones preferred to pay the increased cost for iron pipe, claiming that they could make a better job, and, considering their reputation, would be the gainers in the end. Improvements were gradually made in the construction of threading dies so that a fairly good thread can now be cut on steel pipe, although it cannot be cut as fast as iron pipe and requires more power.

"The improvements in the manufacture of steel still further reduced the cost of production, while the cost of producing wrought iron remained stationary, and it appeared then as if the days of the manufacture of wrought iron pipe were numbered. Several large tube works erected their own steel plants, while others purchased steel skelp in the open market and discontinued their puddle mills. But as time went on it was noticed that for some unknown reason steel pipe would not last as long as wrought iron pipe formerly did under similar conditions. This led to investigations and comparing of notes by the large consumers, and as the experience of them all was in the same direction a reaction set in in favor of wrought iron pipe, and the demand grew to such an extent that the tube works known to manufacture wrought iron pipe had to enlarge their puddling departments and build new puddling mills in order to supply the demand. The largest consumers, especially in the oil fields, again preferred wrought iron pipe, claiming that the saving on account of increased durability was far greater than the difference in first cost.

"The champions of steel pipe, in order to counteract this reaction in favor of wrought iron pipe, then caused to be published in many trade journals and the transactions of engineering societies a large number of articles and tables of laboratory tests purporting to show the superiority of steel. There is no doubt that as a rule steel has a higher tensile strength than wrought iron, and that consequently steel pipe will require a higher pressure to cause final rupture than iron pipe of the same size, but that is only when both are new, and after a few years' use the reverse will often be the case. The thickness of standard pipe is far in excess of what is actually required to resist ordinary working pressure. For instance, it will require over 3000 lb. pressure per square inch to burst an ordinary 2-in. lapwelded wrought iron pipe, but the thickness cannot well be reduced on account of the adopted standards for pipe threads. Therefore it can readily be seen that the higher tensile strength of steel amounts to nothing when used for ordinary pipe.

Loss of Weight in Laboratory Tests.

"A favorite laboratory test is to immerse samples of iron and steel in different mixtures of acids and note the difference in loss of weight after given periods by weighing them on very delicate chemist's scales. A test recently published shows a difference of 1 cg., equal to 2-100,000 lb. per square inch of surface in favor of some secretly prepared steel over knobbled charcoal iron. This, however, does not tell what this same steel would do under actual working conditions. A piece of metal may lose more in weight than another piece of metal, and yet if the loss on the first piece is evenly distributed over the whole surface, and on the second piece it is concentrated in a few spots (pitting), the second piece has really suffered more than the first. A tube or a pipe with a hole eaten in it has lost its usefulness, although the rest of the metal may still be of nearly the original thickness. It is evident therefore that as a guide for behavior under actual conditions such experiments are not only unreliable, but in some cases actually misleading.

"It must be borne in mind that welded pipe can only be made of low carbon steel, and that tests made of the durability of steel rails, coal chute sheets, &c., form no criterion for pipe, as they are made of much harder steel and for this reason they resist the wear due to abrasion better than wrought iron. On the other hand, corrugated steel sheets are generally made of the same grade of low carbon steel that pipe is made of, and as the wear of these sheets is also due to corrosion only, a record of their wearing quality is perfectly germane to the subject under consideration.

"Some difference of opinion exists as to the real reason why wrought iron resists corrosion longer than steel, and while some blame it on the high manganese in the steel others attribute it to the high silicon and cinder in the wrought iron, but they all agree as to the fact that wrought iron pipe does last longer than steel pipe."

A Higher Export Duty on Tin and Tin Ore.—Consul-General D. F. Wilber reports from Singapore that on June 1 the following export duty was imposed on tin, tin ore and manufactured tin, with a 70 per cent. rebate to Great Britain: When the price of tin exceeds $31 per picul (133½ pounds) up to $32, $10 duty; on a price of $32 to $33, $10.25 duty; with a graduated increase on up to $43 to $44 per picul, a duty of $14.50 is charged. Then for every additional $1 per picul in the price 50 cents. The duty will be reckoned on the price telegraphed daily from Singapore, in Straits currency $1 being now equal to 56¾ cents United States gold. On tin ore exported under guaranties that it be smelted in the colony of the Straits Settlements or in the United Kingdom, 70 per cent. of the duty on tin. For tin ore exported without such guaranties, 70 per cent. of the duty on tin, plus an additional duty of $30 per picul.

Tests were made recently with the first of the electric locomotives the New York Central Railroad will put on in October to haul trains between Croton and New York, beginning in October. The cars will be of steel and of the type used in the subway. The locomotives will be able to pull 15 cars each at 60 miles an hour. When the electrification of the Hudson River division is completed 35 of the new electric locomotives will be put on to draw the through trains.

The Ramsey Crank Mechanism.

With the object of increasing the efficiency of single acting engines the Ramsey Engine Company, Philadelphia, has made a departure from customary practice in the crank mechanism. Instead of placing the cylinder so that its center line produced intersects the center of the shaft the cylinder has been offset an amount equal to the radius of the crank. On the working stroke the direct push of the piston is received when the crank is at right angles to the cylinder center line, and not on the dead center. Another effect is that the length of stroke is increased, exceeding the throw of the crank, and as a direct consequence the turning effort is exerted for more than a half revolution. The scheme applied to an internal combustion engine is illustrated in Fig. 1. In this connection it possesses a number of important advantages over the usual arrangement, as will be explained.

In ordinary engine design the length of the connecting rod is approximately five times that of the crank, as if shorter excessive cylinder friction would be caused by the sharp angularity of the connecting rod during the power stroke. The Ramsey crank mechanism employs a connecting rod approximately three and three-eighths times as long as the crank, and the shorter connecting rod is not only practicable but highly beneficial, as will also be shown.

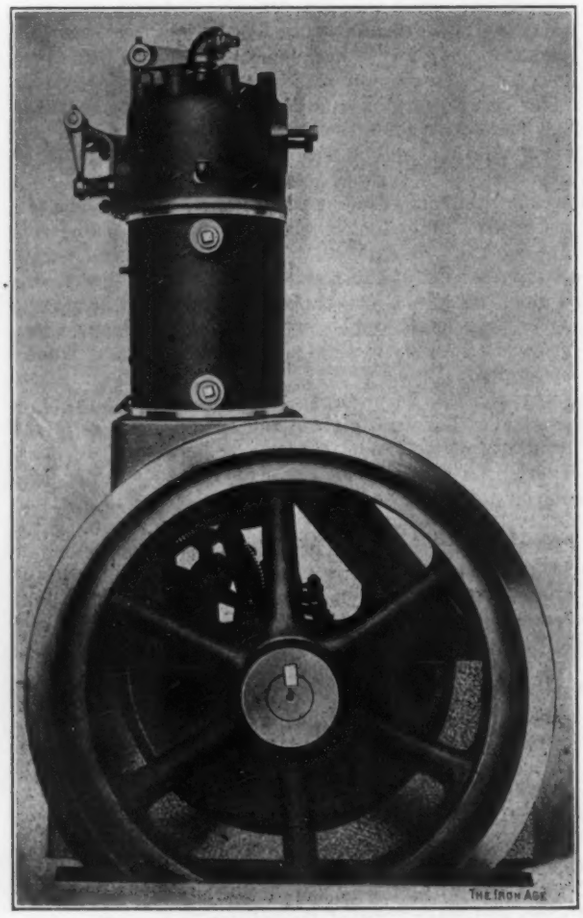


Fig. 1.—A Two-Cycle Gas Engine Equipped with the Ramsey Crank Mechanism.

Referring to Fig. 2, A B and B C represent the positions of an ordinary connecting rod and crank at the beginning of the power stroke, and D E and E C their positions at the end of the power stroke. A D therefore represents the piston stroke, which is equal to the diameter of the crank circle. During this stroke the crank covers exactly one-half of its circle, or 180 degrees. With the Ramsey crank mechanism the positions of the connecting rod and crank at the beginning of the power stroke are shown at A F and F O, while H G and G O represent their positions at the end of the power stroke. A H therefore represents the piston stroke, which exceeds the diameter of the crank circle by about 5.25 per cent., while the crank pin has been driven from F to G through an arc of 192 degrees, or 12 degrees more than one-half the circle. The effect of the longer piston stroke is to increase the expansion of the gases, which not only increases the power to be obtained from an engine, but also the efficiency and economy with which it is operated. The gain in effective crank travel similarly increases the power that can be obtained from an engine of given dimensions.

In Fig. 3 is given a comparison of the piston travels

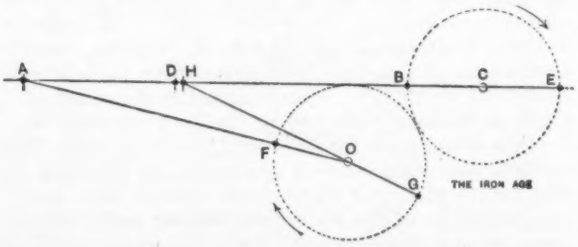


Fig. 2.—Comparison of the Piston and Crank Travels of the Ordinary and Ramsey Mechanisms.

and connecting rod angularities for each 15 degrees of crank travel with both mechanisms. With the ordinary crank mechanism, at the inner dead center the connecting rod is in line with the central axis of the cylinder, and therefore the only friction between the piston and the cylinder is that due to the weight of the piston. Immediately after leaving the inner dead center the angularity of the connecting rod increases very rapidly, as shown, reaching its maximum of 12 degrees when the crank has traveled 90 degrees. When the outer dead center is reached the angularity has again decreased to zero. In each intermediate position the friction between the piston and the cylinder wall is the result of the angular thrust exerted by the connecting rod, and therefore the greater the angularity (pressure and velocity considered) the greater will be the friction.

With the Ramsey crank mechanism the angularity between the connecting rod and the central axis of the cylinder at the inner dead center is 13 degrees. As the piston travels outward on the power stroke this angularity rapidly decreases instead of increases, until, when the piston is traveling at its maximum speed and the crank is in the most favorable position for transmitting the power delivered to it, the angularity is practically zero, and a straight thrust is obtained through a considerable part of the stroke. In the succeeding positions angularities increase again, but very gradually at first. After the crank has traveled one-half its circle the angularity has increased to 21 degrees, while at its outer dead center, corresponding to the position M of the piston, after 12 degrees of further crank travel the angularity is 25 degrees, but at these late points very little friction is caused by the greater angularity, since but

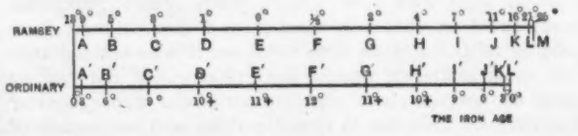


Fig. 3.—The Connecting Rod Angularities Compared for Each 15 Degrees of Crank Travel.

comparatively slight pressure is exerted on the piston and the distance traveled by the piston is small. Only at the extremities of the stroke does the angularity of the ordinary mechanism compare favorably with that of the Ramsey. From the positions B and B′ to the positions I and I′, which include by far the greater part of the stroke, the Ramsey mechanism shows a tremendous advantage in connecting rod angularity over the ordinary mechanism.

The relative travel of the two pistons may be reduced to a percentage basis as follows, these percentages holding good for any length of crank:

	Ramsey crank mechanism. Per cent.	Ordinary crank mechanism. Per cent.
During the power stroke the piston travel at less than a 10-degree angle is.....	88	50
At less than a 9-degree angle.....	85	30
At less than a 6-degree angle.....	73	13¼
At less than a 3-degree angle.....	50	3¼
At less than a 1-degree angle.....	31	1¼

A graphical comparison of the differences in cylinder friction is shown in Fig. 4, indicating to what extent the angularity is reduced by the Ramsey crank mechanism. The solid sections correspond to an engine equipped with

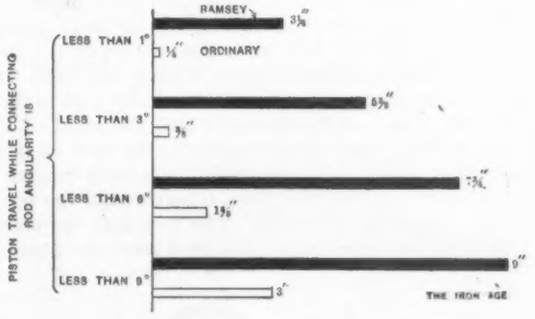


Fig. 4.—Graphical Comparison of Piston Travels Within Given Connecting Rod Angularities.

the Ramsey mechanism and the open sections to an engine equipped with the ordinary crank mechanism, both engines having a 5-in. crank. The figures at the ends of the respective lines show, in inches, the distance traveled by each piston while the connecting rod is at less than the angle indicated with the cylinder axis. The most favorable angularity at which the ordinary crank mechanism has any considerable travel is between 6 and 9 degrees, and at this angularity the Ramsey mechanism has three times as much piston travel. Making the comparison in another way, the Ramsey mechanism has more piston travel at less than a 1-degree angle than has the ordinary crank mechanism at less than a 9-degree angle.

A unique and valuable feature of the Ramsey mechanism is the sluggish movement imparted to the piston at the beginning of the return stroke. In Fig. 5 the distance A B represents the piston stroke of an engine equipped with the Ramsey mechanism, and the line A C represents the part of the stroke that would correspond to the full stroke of an ordinary engine having the same length of crank. From the time the piston passes the point C on its outward stroke and returns to this point on the return stroke the crank travels from E to F, an angle of 60 degrees, or one-sixth of a revolution. This

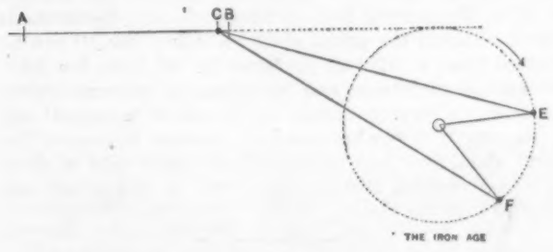


Fig. 5.—Diagram Showing the Sluggish Movement of the Piston at the End of the Forward Stroke and the Beginning of the Return Stroke.

sluggish movement of the piston makes it possible to exhaust the burnt gases with considerably less back pressure than that which is inevitable in an ordinary engine.

Many manufacturers of gas and gasoline engines, who have appreciated the advantages of an auxiliary exhaust port, have hesitated to introduce this valuable feature in their engines because of the offsetting disadvantages involved when the ordinary crank mechanism is employed. The most formidable of these, and in fact the only one which it has not been possible to overcome as yet is the necessity of sacrificing a part of the power stroke for the operation of the auxiliary port. This disadvantage is eliminated by the Ramsey crank mechanism, since the increased piston stroke and the sluggish movement at the outer extremity afford ample time for both the auxiliary exhaust and the main exhaust to be operated after a power stroke equal to the full diameter of the crank circle. In the case of the two-cycle engine the sluggish movement presents a further advantage in that less of the power stroke need be sacrificed by the opening of the exhaust port, while at the same time giving a greater period for voiding the exhaust gases and thus enabling the engine to be run at a higher speed.

In Fig. 6 is shown the Ramsey crank mechanism in comparison with the ordinary crank mechanism, with the cylinder of a two-cycle engine common to both mechanisms. The exhaust port in the upper side of the cylinder and the inlet port in the lower side are so located as to give sufficient time for scavenging and recharging the cylinder of an engine equipped with the ordinary mechanism. With the Ramsey mechanism, if the exhaust valve is placed at AB and the inlet valve at CD, the effective power stroke will be increased more than 8 per cent., while, owing to the sluggish movement already referred to, the same period of time will be provided for scavenging the cylinder and recharging it with fresh gases.

After the piston passes the point of its sluggish movement it returns to the inner end of its stroke very rapidly. As will be seen by comparing Figs. 2 and 5, it requires only 138 degrees of crank travel for the piston to move from the position F, Fig. 5, to the inner end of its stroke. This rapid return of the piston during the compression of the fresh gases minimizes the loss of heat by

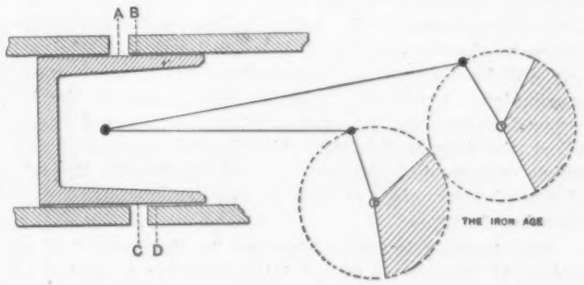


Fig. 6.—A Two-Cycle Engine Diagram, Showing Later Exhaust Possible with the Ramsey Arrangement.

radiation during compression and thus increases the temperature and pressure in the cylinder at the time of ignition, correspondingly increasing the initial pressure of the power stroke.

The short connecting rod used with the Ramsey mechanism, which is made practicable by the position of the crank shaft, reduces the length of horizontal engines, or the hight of vertical engines, in the following proportions:

	Length of crank.								
	In. 2	In. 3	In. 4	In. 5	In. 6	In. 7	In. 8	In. 9	In. 10
Length saved.	3½	5¼	7	8¾	10½	12¼	14	15¾	17½

This feature of compactness, which is always important, is of particular value in automobile and marine engines, or wherever floor space or headroom is limited. It is quite feasible in a horizontal engine equipped with the Ramsey mechanism to employ splash lubrication for the cylinder. Since the crank chamber extends considerably below the cylinder as compared with an ordinary engine, only sufficient oil passes into the cylinder to lubricate the piston, without flooding the cylinder.

One of the most interesting features of the Ramsey mechanism is that it can be adapted to any single acting engine of the present design without interfering with the special features of such an engine. Regardless of what an engine designer's ideas are as to carburetors, valves, valve mechanisms, igniters, lubricating devices, &c., the Ramsey crank mechanism can be applied to any engine without necessitating the abandoning or altering of its

other parts. The mechanism is simple, adds no new parts to an engine and involves no complications. On the other hand, it reduces the cost of the connecting rod forging, and by shortening and compacting the engine, as already pointed out, it reduces the weight of the engine and the amount of the metal required for the frame.

While several engines equipped with the Ramsey crank mechanism have been built and tested and have shown remarkable results, these tests must be considered in their true relation to be of value. That is, in order to determine to what extent the Ramsey mechanism will improve the efficiency of an engine the comparison must be made between two engines of approximately the same design. To make such a comparison an engine was constructed and equipped with the Ramsey mechanism after the lines of a well-known vertical marine gasoline engine having a 9½ x 14 in. cylinder. The manufacturers of the original engine claim for it a fuel consumption of ⅛ gal. of gasoline per horsepower hour, while in the tests made of the engine equipped with the Ramsey mechanism the fuel consumption was found to be from 1-10 to 1-11 of a gallon per horsepower hour. In a series of tests made of this engine under the supervision of the University of Pennsylvania, working under brake loads varying from 22 to 30 hp., the total efficiency of the engine ranged from 24.1 per cent. to 25.9 per cent. These figures refer to the total heat efficiency, that is, the ratio between the total heat supplied to the engine and the heat accounted for in useful work. This compares with a total efficiency of approximately 19 per cent. for the engine equipped with the ordinary crank mechanism, after which the test engine was patterned. So far as is known the results obtained in these tests greatly exceed the results obtained from any other gasoline engine of anything like similar size.

As stated, this is the only accurate basis for comparison. However the efficiency of an engine may be improved by changes in the design, without reference to the crank mechanism employed, this efficiency it is claimed can still be very greatly increased by the Ramsey crank mechanism. In other words, the advantages of the increased expansion, the greater piston stroke and crank effort, the decreased friction, the sluggish movement and quick compression, &c., will materially benefit the efficiency of any engine, without regard to the excellence of its other features.

The Ramsey crank mechanism is the invention of Robert H. Ramsey of Philadelphia, who for a number of years has been making a special study of the subject. The device is covered by patents in the United States and a number of foreign countries. The domestic patents are controlled by the Ramsey Engine Company, with offices in the Bullitt Building, Philadelphia, which company will issue licenses to manufacturers of single acting engines in this country.

The Follansbee Brothers Company's New Steel Plant.

The work of erecting at Follansbee, Brooke County, W. Va., the new open hearth steel plant in connection with the tin plate and sheet steel finishing mills of the Follansbee Brothers Company of Pittsburgh is progressing rapidly. The steel structural work is now all in place and the buildings will be completely finished at an early date. There will be two open hearth steel furnaces, which are well under way and which will be finished shortly after the completion of the buildings. The large engines are already in place and the electrical machinery is now on the ground ready for installation. The entire plant will be finished and in operation in October.

The tin plate and sheet mills of this company since operations were started about two years ago have been devoted almost exclusively to the manufacture of special qualities of high grade roofing tin, charcoal bright tin, special cold rolled and pickled finishes and deep drawing stock. The new open hearth steel plant is being erected for the specific purpose of supplying steel for the finishing mills. A feature of these furnaces is that they are of but moderate size, being of 25 tons capacity. Another feature is an 8-ton hammer which is being installed to hammer most of the product. These features are adopted to insure the special qualities of raw material necessary for the special products of the finishing mills. While the steel works are expected to turn out from 800 to 1000 tons of steel per week, the methods will be almost diametrically opposite to those usually employed, the object in view being to turn out the very best quality rather than a large tonnage at a minimum cost.

The Lunkenheimer Improved Oil Gauge.

An oil gauge for use on dynamos and other machinery having self-oiling journal boxes, embodying some unique and desirable features, has lately been placed on the market by the Lunkenheimer Company, Cincinnati, Ohio. The gauge glass is protected by a metallic shield, free to turn, having two oblong slots, through which the hight of the oil can be seen. One of the features is the easy cleaning of the glass, which is accomplished by simply placing a piece of waste against the glass tube through the openings and revolving the shield. The fact that the shield can be revolved makes it possible to observe the hight of

An Improved Oil Gauge Made by the Lunkenheimer Company, Cincinnati, Ohio.

the oil in the gauge from any position by turning the shield until the glass can be seen through one of the slots.

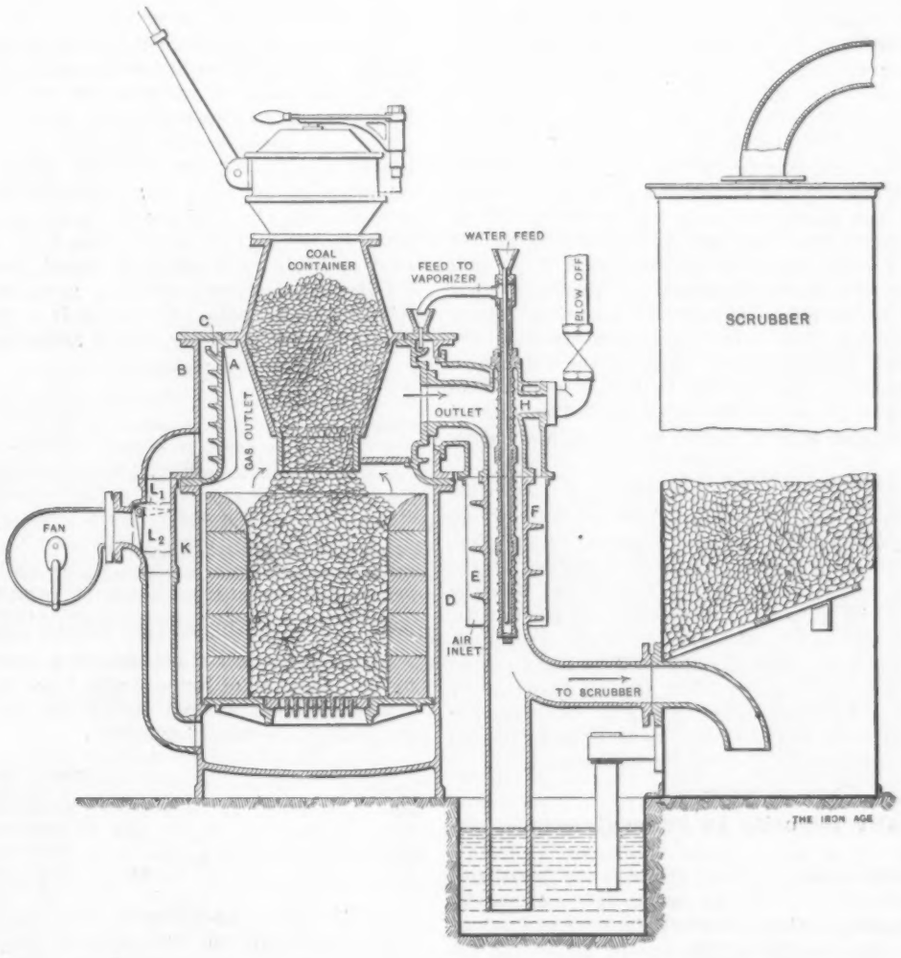
The principal advantage is to be found in the improved construction of the ground key located in the bibb-nose body. Turning this key to the right by means of the small handle attached directly below the shield allows the gauge to be drained independently of the journal box oil receptacle, or by turning the key in the opposite direction both the gauge and the oil receptacle can be drained. By placing the handle parallel with the bibb-nose drain the gauge will register the amount of oil in the journal box oil receptacle and the drain is closed. Should the gauge glass be broken the oil can be drained from it without draining the oil from the journal box oil receptacle, and the glass can be immediately replaced. A wrench applied to the small hexagonal nut at the top of the gauge makes it possible to remove the gauge glass, as it and the shield are simply held in place by a rod running through the center of the gauge and screwed into the key.

The Machine Tool Pocket List, formerly published by the Angus Ballard Company, has been purchased by the Geo. H. Gibson Company, advertising engineer, Park Row Building, New York City. The size of the book will be increased from 3½ x 6 in. to 4 x 9 in., a larger pocket or pigeon hole size, and the buyers' finding list of machine tools and supplies will be made still more complete and definite if possible, although the present list covers over a thousand firms and about two thousand articles and types of tools used in machine shops. Brief articles of interest to manufacturers of machinery will also be added. The *List* will be combined with *Manufacturing*, a journal in which the Geo. H. Gibson Company describes and lists important patents and other industrial opportunities.

English Gas Producer Tests.

The Royal Agricultural Society of Great Britain a short time ago conducted a series of tests at Derby, England, of plants consisting of suction gas producers and engines capable of developing from 15 to 20 hp. maximum. The various English builders were invited to compete, and the results of the trials have been interesting. This society has in the past conducted similar tests of interest to its members, with a view to obtaining knowledge concerning the value of the machines tested in the agricultural arts. Some 30 years ago such a series of tests was made at Cardiff of steam engines, and again in 1887 a similar series of trials was made. Later, with the introduction of the oil engine, an exhaustive test of this prime mover was undertaken. It was only natural therefore that the society, appreciating the general favor which suction gas producers are now meeting, should undertake a thorough test of their capabilities. Among the gas producers tested were those made by Kynoch, Limited, Birmingham; the Railway & General Engineering Company, Limited, Nottingham; the Dawson Economic Gas & Power Company, Limited, London; the Mersey Engine Works Company, Liverpool; the Dudbridge Iron Works, Limited, Stroud; Davey, Paxman & Co., Limited, Colchester; the Campbell Gas Engine Company, Limited, Halifax; Crossley Brothers, Limited, Manchester; Fielding & Platt, Limited, Gloucester; E. S. Hindley & Sons, Bourton; the National Gas Engine Company, Limited, Ashton-under-Lyne, and Newton Brothers, Derby.

The trials involved a full load run lasting nine hours, when the plant was shut down for the night and started up again the next morning, and a no load run of two hours made. Following this the engines were required to take the full load as quickly as possible and to run with it for one hour. The load was then reduced to about quarter full load, and another run of one hour made, followed by an hour at half load, the day finishing with from one and a half to two hours at full load again. At the conclusion of the competition a gold medal and a silver medal were awarded by the society to the makers of the plants named by the judges to be the first and second best, on the basis of the following considerations: Attendance required, the general design with respect to accessibility and compactness, regularity of working, fuel and water consumption, price, relative proportions of producer and engine, and ratio of the volume swept by the piston to the brake horse-power. The gold medal was won by the National Gas Engine Company and the silver medal by Crossley Brothers, but in justice to the other competitors it should be stated that all of the equipments gave such excellent performances that it was a difficult task for the judges to decide between them.



Section of the Gas Producer Built by the National Gas Engine Company, Limited, Ashton-under-Lyne, Manchester, England.

The National producer, being of a new pattern involving certain novel features, is herewith illustrated and briefly described. It supplied an engine having a single cylinder 10 in. in diameter by 18-in. stroke, designed to give 20 b.h.p. at 190 rev. per min. The producer is fitted with a vaporizer in the shape of a ribbed casting, A, surrounding the coal hopper, and the hot gas from the fire below, passing through the angular space between the two, parts with some of its heat to this casting. The internal cylinder, A, of the vaporizer is surrounded by an external cylinder B, which when lifted off exposes the whole of the inside of the vaporizer. This arrangement is particularly valuable, because it frequently happens that hard water only is available for use in these plants, and the effective cleaning of the vaporizer becomes a most important matter, as otherwise the plant fails to work.

The method of distributing the water over the avail-

able heating surface of the vaporizer is also a special feature. An open cup, C, is formed at the top of the vaporizer, and V-shaped notches are cut in this cup at intervals. Practically all of the notches must be in operation to convey away the requisite water for vaporization, with the result that when the water is poured into the cup-shaped trough at the top, a portion overflows through each notch and then drops to the ribs immediately below. The water spreads horizontally along the ribs, and as these are made of different widths, the widest being at the bottom, it is impossible for the water to drop directly from the top to the bottom of the vaporizer. It must either trickle down the sides or drop from rib to rib. In practice this proves to be a most effective arrangement and greatly adds to the efficiency of the vaporizing arrangement.

It is naturally advisable to work the generator on the regenerative principle as far as possible, and, further, the successful working of a plant, apart from efficiency, depends upon an ample quantity of steam passing into the fire along with the incoming air. In order that the air may always carry this requisite amount of steam in suspension it is desirable to preheat it. In the present plant this is done by utilizing the waste heat of the outlet pipe from the generator to the scrubber. The general form of this pipe will be understood from the drawing. The part D has vanes cast on it and is incased by an outside cylinder. The vanes are so shaped that the air has to pass round and round the passages E F, so that when the air reaches the vaporizer its temperature has been raised considerably. To facilitate the steam raising the feed water is first passed downward through the ribbed pipe H, which is placed inside of the outlet pipe already referred to, and thereby heated to a high temperature before it enters the vaporizer. The general method of carrying this into effect will be seen from the drawing.

The fan is attached to the generator in a novel way, which greatly increases the convenience of starting up. The fan is attached to a junction piece K on the pipe, which conveys air and steam from the vaporizer to the ash pit. In starting, the deflector L is moved into the position L_1, while in working it occupies the position L_2, so that the usual cocks and blank plates are done away with. The gases are cleaned and cooled by being passed through an ordinary coke scrubber, and are taken direct from the top of the scrubber to the engine. No steps are taken to reduce the supply at low loads, it being the experience of the company that this is unnecessary.

Iron Ore Deposits in Pennsylvania.

An economic investigation of the iron ore deposits of eastern Pennsylvania will be made this summer by Arthur C. Spencer, geologist of the United States Geological Survey. The *Bulletin* of the Survey makes the following statement in this connection:

The iron ore industry throughout the eastern part of the United States has been rather inconspicuous since the middle of the eighties, when the successful exploitation of the rich, cheaply mined and easily smelted ores of the Lake Superior region began. Being unable to compete successfully with the producers of the Western ores, miners of Eastern ores ceased practically to develop their properties, and since 1894 only the larger of the previously known ore deposits have been worked to meet the demands of local furnaces. In the minds of many, however, the time is now ripe for a great expansion in iron mining throughout the East. When that time does actually come there will undoubtedly be a demand for information concerning the character of the Eastern ores.

A reconnaissance of certain magnetite deposits in York, Lebanon and Berks counties, Pennsylvania, that was made in 1905, shows that these deposits have been hitherto entirely misunderstood. It shows also the probability that careful geologic investigation will reveal a relation between the different deposits leading to a definite recognition of their areal distribution, and thus eventually to the discovery of deposits of commercial importance that are at present unknown.

Production of Iron Ore in 1905.

WASHINGTON, D. C., July 30, 1906.—The year 1905 stands pre-eminent in production of iron ore, with a total for the United States of 42,526,133 gross tons, an advance of 6,871,998 tons, or 20 per cent. over the previous maximum output, 35,554,135 tons in 1902, according to the annual report of the United States Geological Survey, prepared by John Birkinbine, Philadelphia. As compared with the record of the year 1904, which was 27,644,330 tons, the increase in 1905 was 54 per cent.

No other country has at any time approximated an annual production of iron ore such as that reported for the United States in 1905, the maxima of countries supplying iron ore, as recorded to date, being as follows:

United States (1905), gross tons	42,526,133
German Empire, including Luxemburg (1904), metric tons	22,047,393
United Kingdom (1882), gross tons	18,031,957

This statement demonstrates that in 1905 the iron ore product of the United States exceeded the combined output of the maxima years of the two countries which rank next to it in supplying iron ore. Contemporaneous data, if at hand, would show that in 1905 the United States considerably exceeded the output of these two countries for the same year. Considered as a source of metallic iron (for which most of the iron ore mined is applied) the mineral obtained in the United States in 1905 probably produced more metal than the iron ore obtained in Germany, including Luxemburg, the United Kingdom and Spain. Following is a summary of the iron ore statistics for the United States for 1905:

Domestic iron ore produced:	Gross tons.
Red hematite	37,540,198
Brown hematite	2,546,662
Magnetite	2,417,274
Carbonates	21,999
Total	42,526,133
Domestic iron ore exported	208,017
Foreign iron ore imported	845,651
Zinc residuum produced	90,289
Concentrated iron ore produced	755,677
Stocks of iron ore at mines, December 31, 1905	3,812,281
Stocks of iron ore at lower lake ports, December 31, 1905	6,758,511
Production of mines in the Lake Superior region	33,325,018

The development of the iron ore industry, as indicated by the quantities of iron ore mined and of pig iron or its equivalent manufactured during the past five years, is set forth in the following table:

Year.	Iron ore mined. Gross tons.	Pig iron produced. Gross tons.
1901	28,887,479	15,878,354
1902	35,554,135	17,821,307
1903	35,019,308	18,009,252
1904	27,644,330	16,497,033
1905	42,526,133	22,992,380

While these figures show a close relation between the iron ore output and the apparent consumption, there will be noted a variation, which is largely influenced by the stock carried at the mines and at the receiving docks on Lake Erie, where Lake Superior iron ores are stored. Other items are, however, necessary to form a correct comparison, among these being the stocks of iron ores on hand at blast furnaces, mill cinder, scrap, roll scale and other materials charged into blast furnaces, the quantity of iron ore used in open hearth furnaces, used as a flux in silver smelters, in the manufacture of paint, &c. The statement for 1905 shows also that, taking as a basis the domestic ore produced, the stocks of ores at the mines at the close of the year represented 9 per cent., the exports 0.5 per cent. and the stocks at lower lake ports December 1, 1905, 16 per cent. of the quantity of domestic iron ore produced during the year 1905. W. L. C.

The high credit of the United States is demonstrated by the success of the Treasury Department in placing $30,000,000 in 2 per cent. bonds. Bids were opened July 20, greatly exceeding the amount called for and indicating that the loan will be floated at an average of about 104. It must be admitted that the bonds have a special value in their use by national banks, as security for Government funds deposited in such banks.

Canadian Bounty Outlay.

TORONTO, July 28, 1906.—Canada's expenditure on bounties account has been summarized in a statement presented in Parliament by Mr. Paterson, the Minister of Customs. It is as follows:

	Iron.	Steel.
1897	$67,528	$17,366
1898	173,360	67,454
1899	205,465	74,644
1900	248,417	64,360
1901	367,962	100,058
1902	713,658	77,431
1903	626,651	775,154
1904	545,651	347,990
1905	632,362	614,433
1906 (11 months)	624,191	838,591

The bounties on the other articles have only been granted for a few years, and are as follows:

	Steel rods.	Binder twine.	Crude oil.
1904	$5,373	$25,452	.....
1905	221,266	13,789	$350,047
1906 (11 months)	273,440	13,478	267,048

Commenting on these figures the Halifax *Chronicle*, a newspaper friendly to the Government but enthusiastic for the development of the iron ore resources of Nova Scotia, makes these remarks:

"As the present bounties will expire in 1907, and as the question of their extension for a further period will doubtless be considered in connection with the prospective revision of the tariff in November, we desire at this time simply to reaffirm our position—namely, that in any readjustment of the subventions to the iron and steel industry adequate encouragement shall be given to the miner of native iron ore. The present plan has failed of its object because of the peculiar competition from foreign ores, and it is imperative that a new method be adopted to encourage the use of Nova Scotia ores at the smelters, that is to say by granting a bounty direct to the ore producers. This is a proposal which, we are convinced, commends itself to the public and which, if adopted, will, without disturbing vested interests, be instrumental in rehabilitating an industry which should be one of the basic factors of our economic progress."

The Growth of Cast Iron.

The London *Times Engineering Supplement* devotes a paragraph to the question, "Can Iron Grow?" in which it refers to the experiments of A. E. Outerbridge, Jr., Philadelphia, detailed by Mr. Outerbridge in a paper before the American Institute of Mining Engineers, and afterward described in the *Journal* of the Franklin Institute. In a letter to the *Times* a correspondent refers in a later issue to the above article, and says that his 30 years' experience has convinced him of the "growth of iron." He adds: "Rails that have fitted swing bridges with plenty of clearance have had to be shortened repeatedly year after year, and only recently I have known an instance of a swing bridge, which had been open for half an hour, that could not be put back until some of the iron work had been reduced. The bridge had been built for some 13 years, and had been opened and closed during that time many hundreds of times. There is little doubt in my mind that iron heated and cooled alternately does permanently lengthen."

Mr. Outerbridge's paper, to which reference is made, showed by photographic illustrations a number of bars of cast iron which have been expanded up to 46 per cent. increase by repeated heatings and coolings. A bar of machinery steel treated in the same manner at the same time contracted ⅛ in. in 12 in. All of Mr. Outerbridge's experiments showed this remarkable difference between cast iron on the one hand and steel or wrought iron on the other, when heated red hot, allowed to cool and reheated a number of times. It was shown that unless the cast iron is heated to cherry red, it does not permanently expand. This was proved by means of bars heated daily for nine hours for more than a year in an oven and cooled over night. There was no permanent change. The phenomenon to which the London *Times* correspondent calls attention is therefore not at all akin to that demonstrated by Mr. Outerbridge. The increase in length of rails on a swing bridge may be attributed to a purely mechanical cause—namely, the stretching of the rails, due to the rolling of heavy trains across them. Commenting on this, Mr. Outerbridge writes *The Iron Age:* "Heating and cooling day and night would not appreciably change the length of rails permanently. This, of course, has nothing to do with the temporary change in length, due to changes of temperature."

Niagara Power Under National Control.

In accordance with the act granting authority to the Secretary of War to regulate and control the waters of Niagara River for the preservation of Niagara Falls, and as a result of the hearing at Niagara Falls on July 12, Secretary Taft has announced that temporary permits will be granted to power companies to take the following amounts of water:

Niagara Falls Power Company, 8600 cu. ft. per second; Niagara Power Company, 4000 cu. ft. per second; Lockport Hydraulic Company, 500 cu. ft. from the Erie Canal and 333 cu. ft. from the lower level of the same canal at Lockport.

The Secretary of War is of the opinion that the use of the water by the Albion Power Company does not fall within the laws, and for the present he will make no other decision concerning that company. With reference to the application of the Niagara Falls Trust Company as executor and trustee of the estate of Henry E. Woodruff, deceased, the Secretary of War says there does not seem to be any necessity for a temporary permit, as water is not being used, and therefore the consideration of the request wil be postponed.

The Niagara, Lockport & Ontario Power Company has permission to receive into the United States electrical current equivalent to 25,000 hp. daily from the Ontario Power Company, of Niagara Falls, Canada, and the Niagara Falls Power Company is authorized to receive from the Canadian Niagara Power Company not to exceed 25,000 hp. of electrical current daily. These last two permits are the only ones granted for the taking of electricity generated in Canada into the United States, and the Secretary of War states that it will be necessary for him to make a thorough investigation before granting permanent permits for such transmission. Consequently he has designated Capt. Charles W. Kutz, of the Engineer Corps, who, under the direction of General Mackenzie, Chief of Engineers, will make a full report on Canadian power and submit it to Secretary Taft, who will lay it before the American members of the International Waterways Commission.

Secretary Taft's statement shows that under the law the amount of water which he can permit to be taken is limited to 15,600 cu. ft. a second, and he says that it does not seem to be necessary at this time to grant permits to companies which are not actually in operation.

One of the largest and best equipped electric plants in Norway has recently been completed at Drammen, operation being by hydraulic power. The operating head is 45 ft. Current is generated at 5000 volts and raised by static transformers to 20,000 volts for transmission over the 20-mile overhead line to the town, where it is used for a great variety of purposes. A substation in the suburbs of Drammen lowers the voltage to 4500 volts. The equipment at present consists of two Oerlikon alternators of 700 kw. each, running at 210 rev. per min., and operating at a frequency of 50 cycles per second. Two other machines are about to be installed, to operate under the same conditions and to furnish 900 kw. each. All of these machines are of the fixed field type and generate three-phase current.

A valve alloy, which will resist the action of water under pressure, used by one of the largest firms in England, consists of the following: copper, 10 parts; tin, 1 part; zinc, 7-16 part, and lead, ⅛ part.

American Steel Rail Specifications.

A Comparison with Those Abroad and a Proposed Standard for Exports.

An important paper read at the meeting of the Iron and Steel Institute and the American Institute of Mining Engineers in London on July 25 was that of Albert Ladd Colby, New York, under the title "Comparison of American and Foreign Rail Specifications, with a Proposed Standard Specification to Cover American Rails Rolled for Export." It is a thoroughgoing and an able study of the subject, covering, with its table of contents and its extensive bibliography on rails from 1870 to 1906, no less than 52 pages, 6 x 9 in. In his introduction, Mr. Colby argues from the importance of the rail trade in the United States and Great Britain, the two countries having produced in the past 10 years 32,128,720 gross tons of rails and in the past five years nearly 19,000,000 tons. Of late years American mills have so increased their tonnage that they are able to take an increasing amount for foreign delivery.

The bids submitted by American mills, however, have always been accompanied by requests for changes in the foreign specifications, chiefly a reduction of the amount of testing required; and it has only been natural, especially at first, that the engineer, whose specification had always been accepted without question by British mills, should interpret American bids as an evidence that an inferior rail would be furnished his client if the concessions were granted. After often a considerable discussion the specifications have been modified, in some instances on the representation of independent American engineers who make rail inspection a specialty, that the requested modifications or omissions in the requirements would not impair the quality of the rails furnished. A sufficient tonnage of American rails is now in service abroad, especially in British colonies, to establish the fact that in no respect is their service less satisfactory than that of British rails, but there has been no general acknowledgment by foreign engineers that their specifications must be modified if American bids are expected, the concessions being always a matter of individual adjustment. Thus American mills take foreign business with the cost of inspection and the possibility of reduced output as very uncertain factors.

Large Outputs of American Rail Mills.

Mr. Colby states that the object of his paper is to clear up this matter for the best interest of all concerned, by proposing a standard rail specification particularly applicable to the manufacture of rails rolled in America for export. Explaining why the output of American rail mills has increased so materially of late, but at the same time without reducing the quality of the product, Mr. Colby says that the increase in the daily output of American mills in the last decade is not due to an increase in the speed of the rail train, prompted by a reckless desire for increased tonnage, independent of quality, strength and finish. It is rather due to improvements which have given a better balance between producing and finishing ends of the mill. Under present practice the rail train is kept much busier. The bars are brought more quickly to the rails by the use of tables with rapidly revolving rollers; the blooming train is kept busy, owing to ample soaking pit capacity and quick stripping of ingots, and there is always an excess supply of melted iron for the converters, drawn either from adjacent blast furnaces or from mixers. One American rail mill, without change in the speed of its rail train, has increased its output from 1000 to 1800 tons in 24 hrs. But the maximum is not yet reached. With the finishing roll of 26 in. diameter running at 95 rev. per min. its capacity, if a continuous bar were rolled and cut into 33-ft. lengths, would be 28,221 rails in 24 hrs., or 11,087 gross tons of 80-pound rails. While this is only a theoretical calculation it suggests the error of the usual criticism of too rapid rolling.

The paper then takes up in detail and compares American rail specifications with foreign specifications as to process of manufacture, chemical properties, physical properties, tensile tests in foreign specifications, section, weight, length, drilling, finish, branding, inspection and seconds.

The Phosphorus Limits.

Referring to the phosphorus requirements of foreign specifications the writer says that to obtain harder steel or a better rail by an increase in carbon and a reduction of phosphorus is theoretically ideal, but to obtain steel rails with a guaranteed phosphorus content lower than 0.10 per cent. is now impracticable for the majority of American rail makers. The only Eastern rail mill using iron made from Cuban ores can make steel of somewhat lower phosphorus than the seven Western mills using iron made from native ores. By careful selection of ores some of these latter mills could make a small tonnage of rails guaranteeing a phosphorus content of 0.085 per cent., but the extra cost and other trade conditions make this impracticable as a specification. Moreover, no data have been presented proving that rails of the carbon now specified in the United States have failed after a short service because of a content of 0.10 per cent. of phosphorus. Attention is called to the fact that careful heating and lower finishing temperatures easily overcome a difference of 0.020 per cent. in phosphorus. It has not been shown that American rails in foreign service have proved more brittle than those of British make.

The discussion as to tensile strength is gone into at some length because of the frequent appearance of this test in foreign rail specifications, and the fact that none of the American rail specifications include a specified tensile strength, elongation or contraction of area, since the data thus accumulated are not considered of any practical value to the purchaser.

In the concluding portion of his paper Mr. Colby submits the following proposed standard specification to govern the manufacture in American mills of steel rails for export. He says that in its preparation "an effort has been made to avoid ambiguity, to bring related requirements together under one heading, to make them definite and concise, but to leave the specification flexible enough to allow an intelligent inspector to use his discretion in doubtful cases without jeopardizing the duty he owes to the purchaser. It provides that his decision shall be prompt, so as not to hamper unnecessarily the manufacturing operations when the maker in good faith has agreed, in signing the contract, to live up strictly to the conditions required."

Specifications for American Steel Rails for Export.

1. *Process of Manufacture.—a,* The steel shall be of the best quality and made by the Bessemer or Siemens-Martin process.

b. The materials used and the entire process of manufacture and testing shall be in strict accordance with the best standard current practice, and special care shall be taken to conform to the following instructions.

c. No cracked or badly patched molds shall be used, and the ingots shall be kept in a vertical position in the pit heating furnaces until ready to be rolled, or until the metal in the interior has had time to solidify.

d. No "bled" ingots shall be used, and no ingots from "chilled" heats rolled into first quality rails. A "bled" ingot is one from the center of which liquid steel has escaped. A "chilled" heat is one which, because of the cooling of the steel, has to be either pricked or poured over the top of the ladle.

e. Sufficient material shall be discarded or "cropped" from the top of all ingots to insure sound rails.

f. Under no circumstances shall an ingot or rail bloom be heated so high that the cinder on it runs, when being drawn from the soaking pit or heating furnace. The ingots or blooms must be evenly heated throughout their length, drawn at a uniform temperature and a uniform finishing temperature also maintained.

2. *Chemical Composition.*—Rails of the various

weights per yard specified shall conform to the limits in chemical composition shown in the following table:

	50 to 60 lb. Per cent.	Over 60 to 70 lb. Per cent.	Over 70 to 80 lb. Per cent.	Over 80 to 90 lb. Per cent.	Over 90 to 100 lb. Per cent.
Carbon	0.30-0.50	0.35-0.45	0.35-0.45	0.40-0.50	0.40-0.50
Manganese	0.75-0.95	0.75-0.95	0.75-0.95	0.80-0.100	0.80-0.100
Silicon*	0.10	0.10	0.10	0.10	0.10
Phosphorus*	0.10	0.10	0.10	0.10	0.10
Sulphur*	0.07	0.07	0.07	0.07	0.07

* Maximum.

3. *Chemical Analyses.*—The manufacturer shall make and furnish to the representative of the engineer (or of the purchaser), before the rails rolled on each turn are ready for shipment, determination of carbon and manganese on each heat of steel; determinations of phosphorus on six heats every 12 hr., and determinations of silicon and sulphur on a sample representing each 12 hr. rolling; all said analyses to be made on drillings from a test ingot cast when teeming each heat.

The results of these analyses shall govern, but prior to and during the rolling of the rails the inspector shall be given all reasonable facilities to satisfy himself that the maker's method of sampling each heat is in accordance with the best standard practice, and that the various constituents of the rail steel will be accurately determined. If so desired, but prior to rolling, the inspector may submit to the manufacturer and to an independent chemist of repute, a properly prepared sample of rail steel for joint analysis, with a view of proving the accuracy of the analyses which will be furnished daily from the mill laboratory when rolling begins; the expense of this joint analysis to be equally divided between the contractor and purchaser.

If during rolling the accuracy of any report from the steel works laboratory on a heat of steel is promptly questioned, and not immediately settled to the inspector's satisfaction by a check analysis at the mill, the inspector will be furnished an identified sample of drillings from the test ingot, the analysis of which, by an independent chemist of repute, must be furnished and the dispute settled before the rails from said heat are ready for shipment. The purchaser shall pay the cost of any and all such check analyses.

If requested, the manufacturer shall furnish, on an average sample of the tonnage rolled, a determination of arsenic, copper or other constituents incidently present in determinable quantities.

4. *Impact Test.*—From either end of a rail, from every other heat of steel, shall be cut, at the hot saws, a piece from 4 to 6 ft. long, which shall be distinctly stamped with the heat number, as directed by the representative of the engineer (or of the purchaser), and the piece set aside on skids to cool. As soon as cool it shall be placed, head upward, on the supports of the standard American rail drop testing machine described below, and the various sections must withstand without facture one blow of the 2000-lb. tup from the hight specified in the following table:

Weight of rail. Pounds per yard.	Hight of drop. Feet.	Range in carbon. Per cent.
50, up to and including 60	16	0.30-0.40
More than 60, up to and including 70	17	0.35-0.45
More than 70, up to and including 80	18	0.35-0.45
More than 80, up to and including 90	19	0.40-0.50
More than 90, up to and including 100	20	0.40-0.50

The report of the drop test shall include a record of the atmospheric temperature at the time the tests are made and if necessary, due allowance shall be made for rails tested at or below freezing temperature.

With regard to a provision for retest, in case the pieces of rail selected to represent the heat fail under test two other rails will be selected and similar lengths cut therefrom, or crop ends of sufficient length already cut from two other rails of the same heat may be used. If either of these pieces or crop ends fail, all the rails of the heat which they represent will be rejected, but if both these latter tests meet the requirements all the rails of the heat will be accepted. In case the rails from two successively tested heats are rejected for failure to meet the requirements of the drop test, the intermediate heat will be tested as above described. The acceptance or rejection of all the rails from any heat will depend upon the result of the drop test thereof.

5. *Drop-Test Machine.*—Prior to making any impact tests the inspector shall be given opportunity to satisfy himself that the drop-testing machine in its essential features complies with the following requirements: The weight of the tup shall be 2000 lb., the radius of its striking face 5 in., the weight of the anvil block shall be amply sufficient to insure rigidity, and, moreover, it shall rest on a solid masonry foundation. The iron or steel supports for the rails shall be rounded to a radius of 5 in., set 3 ft. apart between centers, and shall be firmly secured to the anvil block. The tup shall be so arranged that it can be conveniently dropped from any specified hight.

6. *Section.*—Before the general manufacture of the rails is commenced the manufacturer shall, if required by the engineer (or by the purchaser), supply two sets of templets, internal and external, made of approved material. These templets, engraved as specified in the contract, shall be submitted to the engineer (or to the purchaser) for his approval, and at the commencement of rolling the engineer will have a competent person present to approve of the section.

The rails shall be of uniform section throughout and shall conform as accurately as possible to the approved templet, consistent with paragraph No. 7, relative to specified weight. To allow for the unavoidable wear of the rolls a variation in hight of 1-64 in. less and 1-32 in. greater than the specified hight will be permitted. A perfect fit of the fishplates, however, shall be maintained at all times.

7. *Weight.*—The weight of the rails shall be maintained as nearly as possible, after complying with paragraph No. 6, to that specified in the contract. A variation of 0.5 per cent. for an entire order will be allowed. The manufacturer shall weigh one rail each hour during the entire rolling. Rails shall be accepted and paid for according to actual weight.

8. *Length.*—The standard length of rails shall be 33 ft. Ten per cent. of the entire order, if made, will be accepted in shorter lengths, varying by even feet down to 27 ft. A variation of 0.25 in. longer or shorter than the standard length will be allowed. This allowable variation shall be ⅜ in. longer or shorter for rails over standard length.

When rails or special lengths, slightly shorter than 33 ft., are ordered for curves they will not be counted in the allowable percentage of short rails.

9. *Drilling.*—Circular holes for fishbolts shall be drilled through the web from the solid at each end of the rails and in strict accordance to the specification. They shall conform accurately to the drawing and dimensions furnished in every respect, must be clean and square with the web and left without burrs on either side.

Should any of the holes vary from the correct size or position more than 1-32 in. the rails in question will be liable to rejection.

10. *Finish.*—Rails shall be straight in line and surface when finished, the straightening being carefully done while cold; smooth on head, sawed square at ends (variation to be not more than 1-32 in.), and prior to shipment shall have the burr occasioned by the saw cutting carefully chipped and filed off, particularly under the head and on top of the flange; the ends must be clean. The rails are to be free from injurious defects and flaws of all kinds.

11. *Branding.*—The maker's name, initials or other recognized mark, the month and year of manufacture and the initials of the railroad, shall be rolled in raised letters on the side of the web. If specially desired the weight of the rail per yard will be added.

The heat number shall be plainly stamped on the web of each rail while hot in at least two places and at a sufficient distance from the ends so that it will not be subsequently covered by the fishplate.

All rails definitely rejected shall be at once marked in such a distinctive manner as will enable the inspector to readily identify them, but not so as to render them unsalable to other parties.

Both ends of all "seconds" or No. 2 rails to be painted white. Both ends of all short lengths first quality or No. 1 rails to be painted green. Special length rails for curves to be painted red.

12. *Inspection.*—The manufacturer shall give to the engineer (or the purchaser) or his inspector, if so instructed, a reasonable notice in writing before rolling shall be begun, and similar written notices in advance of each resumption of rolling in case the order is not filled at one continuous rolling. Should the maker fail to give said notice all rails rolled in the absence of the duly authorized representative may be rejected as part of the contract. The party thus notified shall in turn give written notice to the manufacturer of his intention to be present or permission to proceed at the time designated by the maker.

Authorized representatives shall have free access to the works of the manufacturer at all times when the contract is being filled and shall have free of cost all reasonable facilities afforded by the maker to satisfy them that the finished rails are furnished in accordance with the terms of these specifications. The inspection shall therefore be conducted so as to cause no serious delays in the processes of manufacture.

Rails will be passed upon individually or by heats, according to the character of the requirements specified. Rejected rails to become at once the property of the maker.

All tests and inspection shall be made at the place of manufacture, and the engineer or his representative at the mill shall be empowered to give the necessary written certificates of acceptance to the manufacturer in such a manner as not to cause delays in the shipment of inspected rails.

13. *"Seconds" or No. 2 Rails.*—Rails which possess any injurious defects, or which from any other cause are not suitable for first quality or No. 1 rails, shall be considered as "seconds" or No. 2 rails. They shall not have flaws in their heads of more than 0.25 in., or in the flange of more than 0.5 in. in depth, and in the judgment of the inspector these shall not be so numerous or of such a character as to render them unfit for recognized No. 2 rail uses, such as in the main track at stations, in sidings and in yards. The ends of No. 2 rails shall be painted white, and they shall have two prick-punch marks on the side of the web near the blow number brand, and placed so as not to be covered by the fish-plates.

No. 2 rails will be accepted up to 5 per cent. of the whole order.

Dodge & Day, engineers, have recently removed their offices to the Drexel Building, Philadelphia, where they have facilities that enabled them to make some important changes in their methods and organization. These have been principally occasioned by the development of one of their departments, namely, that in which they attend to all of a client's work from the construction of buildings to the installation of equipment. The advantage of placing in the hands of one concern the responsibility for everything from inception to the completion of a plant is recognized, and this firm is now in position to act in this capacity for its clients. It has recently secured a number of commissions on this basis.

In the equipment of the Carmania, which is the first and only turbine liner as yet to come into New York harbor, are a considerable number of electric motors for hoisting purposes. Three are connected with the turbine hoist apparatus, one for each of the main turbines of the ship, to lift the casing or rotor when inspection or adjustment are required. On the boat deck are two electric winches; in the lower deck storerooms are three motors, to be used in raising stores to the galleys and pantries. Of the latter, two have a capacity each of 300 pounds and the other of 500 pounds. A 200-pound coal hoist keeps the galley supplied with fuel; a 500-pound hoist is used in the mail sorting room, and can operate at a speed of 150 ft. per minute. The generating plant consists of four sets, each of 75 kw. and running at 450 rev. per min.

The Piece Price System for the Naval Gun Factory Rejected.

WASHINGTON, D. C., July 31, 1906.—A carefully worked out project for the installation of a piece price and premium system in the machine shops of the naval gun foundry, devised by Rear-Admiral Leutze, commandant of the navy yard, has been rejected by the Navy Department after a hearing given to the men. For the past two years the superintendent of the gun factory has been seriously embarrassed by the limited facilities of the plant, which have not only prevented him from producing a satisfactory output, but also made it necessary to let large amounts of ordnance work by contract. Not only has the plant proved too small to do the work required, but it has also been lacking in symmetry, and at times it has been necessary to suspend operations in certain departments to permit other branches to catch up. Congress has shown great reluctance to comply with the recommendations of the Secretary of the Navy for increased appropriations for the maintenance and development of the gun factory, and the commandant has been obliged to resort to every possible device to relieve the pressure upon him. A careful investigation recently convinced him that a largely increased output in the machine shops could be obtained by the adoption of the piece and premium system in place of the present method of paying for all work by the hour. Calculations based on performances in the machine shops showed that without undue effort the earnings of the men could be materially increased, and the Government would not only have the advantage of larger daily product without increasing the investment, but would be able to supply a considerable amount of ordnance to waiting warships at much earlier dates than would otherwise be possible. Admiral Leutze therefore recommended the change and Assistant Secretary Newberry took the matter up, being very favorably predisposed to the adoption of the new plan.

As soon as the projected change became known to the employees of the machine shops, however, a protest was lodged with the Navy Department, and on July 26 a delegation had a hearing before Mr. Newberry. Emmett L. Adams, spokesman of the employees, said that the delegation represented all the 4000 workmen in the yard, both union and nonunion, and desired energetically to oppose Admiral Leutze's project. He declared that the mechanics knew from experience that the premium system would operate to the disadvantage of both the men and the Government. If it was necessary to change the present system, he believed there were other methods that would give better results. The machinists, he said, regarded the premium system "as a relic of the sweatshop," and if it were adopted by the Government "it would perhaps cause a greater revolution among the industrial classes than any other change that could be suggested." Assistant Secretary Newberry discussed the subject in detail with members of the delegation, whom he examined at length as to general conditions in the gun factory and as to the need of additional equipment.

Upon the conclusion of the hearing, and after the employees had withdrawn, Mr. Newberry gave out an informal statement, to the effect that if the employees of the yard, whom the proposed system was designed in part to benefit, did not want it it would not be adopted. Leading ordnance experts of the Department, who have warmly supported Admiral Leutze's project, regret Mr. Newberry's decision, as it was believed that a large increase in output would result without addition to existing facilities. The opinion is expressed in some quarters that the influence of the union leaders in the shops was strongly exerted upon all nonunion workmen and resulted in suppressing considerable sentiment in favor of the proposition.

W. L. C.

A cement for fastening iron to marble, which is reported to give good results, consists of 30 parts of plaster of Paris, 10 parts of iron filings and ½ part of sal ammoniac. It is mixed with vinegar to a fluid state, and, since it hardens if allowed to stand, is prepared only when to be used immediately.

New Publications.

American Structural Shops. (Amerikanische Eisenbauwerkstaetten.) By Prof. H. Reissner, Berlin. Published by Richard Dietze, Berlin.

Professor Reissner spent a year in American structural shops, and over three months in a tour of inspection under the auspices of the Technische Hochschule of Berlin. The results of some of his studies are embodied in the volume just issued, which is chiefly description of a number of the plants and their equipment. He deals with the general layout of Riter & Conley, McClintic-Marshall, Pennsylvania, Pencoyd and Ambridge, and with the special machinery employed. The latter is notably elaborate in the case of Pencoyd, Cambria, Pennsylvania, Ambridge and Boston works, there being printed many excellent photographs and detail drawings. By way of introduction, Professor Reissner discusses some general facts and considerations relating to markets, organization, labor and materials. It is a characteristically thorough German piece of work.

Electric Power Transmission.—A Practical Treatise for Practical Men. Fourth edition, revised and enlarged. The McGraw Publishing Company, New York City. Size, 6 x 9 in.; pages, 700; illustrations, 350; price $4.

It has been some three years since the third edition of this work appeared. Since that time, while there have been no marked departures from general practice, there have been sufficient improvements made in station accessories and in details of construction to warrant the rewriting of parts of the book, the elimination of some matter now obsolete and the addition of some 90 pages, to maintain it a standard authority on its subject. In the preface of this edition the author states that plants have multiplied and higher voltages have become common, and that improvement is most to be noticed in details of construction, especially of the line. He also states that much apparatus formerly considered special has since become standardized, and that it is now needful to devote special attention to the important accessory apparatus which fills modern stations. Formerly the book attempted to list all American plants operated at 10,000 volts, but as these have become commonplace, the list of high-voltage transmission plants now includes none working under 20,000 volts. The author calls attention to this as a fact that expresses better than words the trend of recent advances in the art. To cover the contents of the book would be almost out of question in a review of this character, and, in fact, the work is so well established as an authoritative treatise that it would be superfluous to attempt to cover it in detail. It is sufficient to state that it embraces almost every consideration that the designing engineer would be concerned with in connection with a power station, from the engines and boilers, or water wheels, as the case may be, to the transmission line for distributing the current.

The Corrosion and Protection of Metals. By A. Humboldt Sexton. Pages, 147, 4¾ x 7¼ in. Price, 5s. net. Published by the Scientific Publishing Company, Manchester, Eng.

The author, who is Professor of Metallurgy in the Glasgow and West of Scotland Technical College, has prepared several manuals on chemistry and metallurgy, and is the author of works on producer gas, fuel and refractory materials, and the metallurgy of iron and steel. In writing on the corrosion and protection of metals he has entered a field which has been little worked, literature on this subject being for the most part limited to stray papers read before engineering societies. In recent years there has probably been more active experiment than formerly, and the present volume is of timely value in this country in view of the recent decision of the American Society for Testing Materials to appoint a committee to carry on a thorough investigation of the corrosion of iron and steel. The little volume before us is made up of seven chapters, with the following titles: "Rusting of Iron and Steel," "Protection of Iron and Steel from Atmospheric Corrosion," "Atmospheric Corrosion of Other Metals," "Corrosion of Metals by Corrosive Gases," "Corrosion of Metals by Water and Other Liquids," "Corrosion of Iron and Steel by Sea Water," and "Corrosion of Copper and Brass by Sea Water." In discussing the causes of atmospheric corrosion the author differentiates carefully and in his exact statements disposes of some of the popular notions in this connection. After stating that pure water has no corrosive effect on iron, and putting in the same category air, carbon dioxide, water and air, water and carbon dioxide, and air and carbon dioxide, the final statement is made that air and carbon dioxide and water together cause rapid rusting. From this basis the author proceeds to the discussion of other causes of corrosion, including sulphurous gases, and goes with some detail into an explanation of the usual phenomena of the rusting of iron.

The chapter on the protection of iron and steel from atmospheric corrosion is particularly interesting. The various coatings are classified as follows: 1, a layer of another metal; 2, a metallic oxide; 3, a layer of paint, varnish or bituminous (or other) composition; 4, a porcelain enamel; 5, a layer of cement or similar substance. The requirements of a coating which will afford satisfactory protection are enumerated and the various classes of coatings are discussed at some length. Fuller treatment could have been wished of the interesting subject of metallic coatings, which the author summarizes in a half dozen pages, under the headings "Tin," "Zinc," "Copper and Nickel," and "Oxide Coatings." Paints and carbon coatings are handled excellently, though here the amount of literature that has preceded the book is greater than in most departments of the general subject. The author picks his way carefully in considering the relative corrodibility of iron and steel. In the first place he points out that the terms iron and steel are very vague, materials known by the same name not being by any means identical. Referring to mild steel he states that the percentage of carbon and other constituents which may be present in a small quantity, while having little effect on the physical properties may have considerable effect on corrosion. He states generally his conclusions as follows:

1. That the corrodibility of the metals in the atmosphere, in fresh water and in sea water follows generally the same order.

2. That cast iron resists corrosion better than any other form of iron and steel, the close grained irons being less acted on than the more open grained varieties. He is at present unable to say which constituents have most influence on the durability. Cast iron which is left with the skin as it comes from the mold is less easily corroded than that which has been machined.

3. That malleable iron is as a rule less easily corroded than mild steel, but experiments do not always show this to be the case. The purer the steel the less it seems to be corroded, and probably very pure steel would have about the same rate of corrosion as malleable iron, and it would probably be safe to say that for most purposes there is little difference between the two metals. Where, however, resistance to corrosion is important, it is safer to use malleable iron. The evidence on this point is very conflicting, but the opinion of practical users is very strong that malleable iron resists corrosion better than mild steel. The foreign constituents present in steel seem to have a marked effect on its durability, but the author is not at present able to say which constituents promote and which retard corrosion.

There is another point of interest that may be mentioned, and that is the effect of strain on corrosion. Professor Barr has pointed out that in boilers corrosion in the form of grooving takes place most rapidly on those parts which are subject to bending strain, the action being due to the fact that the scale is constantly broken off and fresh surfaces are exposed to corrosion, and thus corrosion may be considerably accelerated. The mere fact of a metal being under stress may also modify the corrosive action.

The field for a work of this character is emphasized by the bibliography cited by Professor Sexton, only two books being named, one of 1900 and the other of 1906, and one paper, which he considers the most important of recent date, that of J. T. Milton and W. J. Larke, on "The Decay of Metals," read before the Institution of Civil Engineers. Some papers and reports before American societies have probably escaped the author's attention.

The Link-Belt Engineering Company, Philadelphia, manufacturer of elevating and conveying machinery, has changed its name to the Link-Belt Company.

THE IRON AGE

1855—1906.

New York, Thursday, August 2, 1906.

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Prosperity and High Prices.

The iron trade has long since accustomed itself to the lack of unison often seen between prices of iron and steel products and prices for the securities of the leading iron and steel companies. This divergence has suggested that the causes of price fluctuations are not always obvious. Discrimination is necessary also between price changes that are due to temporary causes and those due to causes operating over a considerable period.

Much has been said in the years of prosperity the country has enjoyed since the late nineties of the high level of prices prevailing, of the advance that has taken place in the cost of the necessities of life and of the hardship this has brought to persons whose salaries have remained the same. Day wages have advanced materially, but further advances have been asked in the past year or two, the reason usually given being that the higher cost of living has more than consumed those previously made. The statistical information available has sustained the general statement as to the enhancement of values. Dun's index number of commodity prices was $105.216 on July 1, as against $106.794 on June 1 and $106.059 on May 1, and compares with $98.312 on July 1, 1905. The advance in the year, in spite of the small decline in June, was thus about 7 per cent. The low point in recent years was reached on July 1, 1897, when the figure was $72.455, and the lowest yearly average for the 46½ years covered by the Dun tables was $75.502 for 1897.

Since it is recognized that a period of sustained high level prices, or even a brief period of abruptly advancing prices, is apt to be followed by a decline in demand—in fact, that high prices sooner or later are the cause of a falling off in consumption—it is natural that prosperity should be attended by predictions of a change for the worse. These are based on the periodic alternation of activity and reaction in trade and industry and the tendency of men to take prosperity as a matter of course and to forget the lessons supposed to have been learned in the last preceding period of leanness.

It is a matter of computation that the consumptive capacity of the United States has been increasing in the past decade more rapidly than the population. Per capita circulation of money and per capita wealth have increased in that time, as have also the per capita yield of the ground and per capita production of manufactures. All the signs of prosperity have been present—the largest employment of labor and the largest ability to supply human wants. As is natural, there has been an expansion in the expenditures for luxuries, and the economies of times of depression have gone out of vogue. The prodigality of supply has led to wasteful use. At the same time any disposition to emphasize the present lack of sensitiveness to the prevailing high prices has been branded as only an intrusion of pessimism. Yet unquestionably the inevitable human failings that go with prosperity are more to be feared now than the weaknesses of our currency system, on which occasionally a strongly alarmist note is sounded.

Apart from these considerations and yet having a most important bearing on the present price situation is the gradual and therefore more permanent influence of the remarkable increase in the world's gold supply. More was heard of this when security prices were being advanced last year in the face of a tightening money situation; but it is still an important factor in any conclusion as to the effect of the present high level of prices upon the duration of prosperity. In the June issue of the quarterly publication of the American Statistical Association Francis B. Forbes presents a study of "The World's Recent Production of Gold and Its Influence Upon Commodity Prices," that is an important commentary on the price movement of the decade beginning with 1895. Quoting from the United States Mint Reports, the author presents statistics showing that the world's stock of gold money which was $4,087 millions on January 1, 1895, increased $1,900 millions in the next ten years, and was thus $5,987 millions on December 31, 1904. Of the increase the United States secured $730 millions, other countries in North and South America $109 millions, all Europe $786 millions, and Asia, Africa and Australasia $275 millions, most of which went to India, leaving to be accounted for only $30 millions. Turning to a study of price tables Mr. Forbes finds that in Europe, as indicated by Mr. Sauerbeck's index numbers for English prices, the general advance in commodity prices since 1896 has been 15 per cent. In the United States, taking the Dun tables and those of the Labor Bureau at Washington, the advance at the close of 1904 in the general level of prices as compared with 1897 was about 30 per cent. To-day's level represents an advance considerably greater. We will not now go into the details of the author's explanation of the lessened effect of the gold increase in Europe in the past ten years as compared with that shown in the United States. It is sufficient to say that the gathering in of gold reserves between 1895 and 1904 by various European Governments which had been practically under régimes of inconvertible paper money accounts for the absorption in that period of $568,000,000 of gold, or nearly one-third the total amount produced in the decade, which became available for money. Thus the influence of this new gold did not extend to any general enhancement of prices. As the United States definitely decided in 1896 to adhere to the gold standard, the $73,000,000 annually added since 1895 to our gold supply has been exerting its full power as a support for advancing prices through almost the entire decade. The conclusion of the author is, in part, as follows:

> It remains to be seen whether there is to be a continuance of the process of acquiring gold as an adequate mainstay for existing prices, by several important countries which have recently passed from inconvertible paper money to the gold standard. In the meantime, speaking broadly, the new gold has certainly contributed its fair share to their greater financial security and prosperity, as it has done to ours, and without it the level of prices could nowhere be what it is to-day.
>
> On the other hand, it must be remembered that the horizon of the world of commerce and industry is now infinitely wider than that of the last generation, and each ounce of gold has to serve as a basis for more transactions than before. Even, therefore, with a constant growth in the output of that metal, the new conditions under which commodities are produced seem to preclude anything like a return to the price levels of 35 years ago.

The most familiar feature of the iron trade in the years following the boom of 1899 has been the moderation with which prices in most lines have been maintained under conditions that might have been attended with a rapid ascent. This fact, taken in connection with the broad price-enhancing movement due to the enormous increase in the world's gold supply puts to-day's prices for

iron and steel more nearly in line with those of less prosperous times. If there are reasons growing out of the various considerations urged above for looking upon the present commodity price level as less likely to invite serious reaction than would have been the case 10 or 15 years ago, there are stronger reasons for believing in the comparative stability of values in iron and steel.

Advancing Fire Insurance Risks.

A radical advance in fire insurance rates has resulted from the tremendous losses sustained by the companies in the San Francisco disaster. This advance should have a marked influence in making more general the use of automatic sprinklers and other precautionary appliances, which are necessary in industrial or other buildings if the owners are to have the cheapest forms of insurance. The increase of rates does not apply to any risk where sprinkler systems are installed, either in what are known as the conflagration areas of the cities or in neighborhoods where there are no waterworks protection. These two classes of territory are the only ones affected. Mercantile and manufacturing properties located within conflagration areas have had their rates increased from 12 to 15 per cent., while what are known as unprofitable risks, located away from waterworks protection, have had to take an advance of 25 per cent. In neither instance, as has been stated, is property protected by automatic sprinklers affected.

The fire insurance companies are being subjected to a great deal of censure because of these higher rates, but these critics overlook the fact that with such a tremendous blow to their resources, in many instances not only wiping out the surplus but causing stockholders to be assessed, provision must be made against the possible contingency of another great conflagration. Premiums on existing policies are not affected, of course, and, excepting in those cases where policies are immediately maturing, old rates may be procured by equipping property with appliances for fire protection according to the accepted rules and standards of the insurance companies.

The demand for all forms of fire protection, including sprinkler systems, is very great at the present time, and probably it would be impossible to procure the immediate installation of an extensive fire protection system to forestall the advance in rates which must come with the taking out of new policies in the immediate future. But fire insurance companies make deductions in premiums of existing policies if properties are safeguarded against fire, by means of sprinklers or otherwise, after the policy is issued, so that the larger premium resulting from the recent advance may be made to be a temporary one.

The initial cost of adequate internal fire protection in an industrial or commercial building is necessarily large, but there are few who have thus equipped their buildings who would be willing to say that the investment is not a good one. The difference in insurance rates is great, reckoned in percentages, and this is not by any means all the return that the investment secures. Many fires which might otherwise be serious are flooded out in their infancy by automatic sprinklers. Not only do insurers who suffer from fire in their establishments seldom find their loss covered when the insurance is adjusted, but the actual loss of property is usually greatly increased by the loss which comes with the shutting down of a business, the necessary cancellation of orders and the dispersion of customers, who must go elsewhere for their goods, some of them to stay away permanently. Organization is disrupted, and it may take a long time to get the business back to where it would have been had there been no disaster. This is the real value of the fire protection investment, as a safeguard against fire rather than as a saving on insurance premiums, though the latter item is always of importance.

It has been well said that the industries of the country owe much to every factor which tends to impress the value of fire protection upon manufacturers, and of course the same thing is true as applied to commercial interests. If an advance in insurance rates stimulates business men to save premiums by equipping their property with modern appliances for extinguishing fires, the advance may be characterized in the long run as a beneficial influence.

Progress in Mechanical Puddling.

The increasing interest with which the position of rolled iron products has been discussed in the past year or two gives timeliness to some of the statements in the paper by James P. Roe on his mechanical puddling process, read at the joint meeting in London last week of British and American mining and metallurgical engineers. A description of the process which Mr. Roe presented to the American Institute of Mining Engineers in 1902 covered the early form of his invention. Since that time the furnace has been remodeled. A change has been made in the shape of the bottom and improvements have been made in the squeezer. In his London paper Mr. Roe states that his experiments at Pottstown, Pa., have demonstrated that in a well-designed plant with continuous running the cost of producing iron blooms of mechanically puddled iron would not exceed the cost of steel blooms in a well-equipped steel works. This conclusion is a matter of inference, since no absolute data as to commercial costs could be obtained from the single furnace that has been operated thus far. A sufficient number of units must be provided to give a tonnage more comparable with steel works outputs. Mr. Roe and his associates feel assured, however, that they have made ample allowance, and that their work thus far establishes the process as a competitive proposition applicable to large units and adapted to the use of metal direct from the blast furnace, as is now done at both Bessemer and open hearth steel works.

In what has been written in the last 15 years as to the "passing of the puddler" emphasis has always been put upon the displacement of iron by steel. But, as was pointed out in a recent comment in these columns on the statistics of rolled iron production in the United States in 1905, there has been also a displacement of puddled iron by the product of the busheling furnace or the piled or faggoted material worked in the heating furnace. That rolled iron has not taken a more conspicuous place alongside of steel may be due to the fact that the claims of superior wearing quality, on account of which for some uses it has been preferred to steel even at a higher price, have not been borne out by the products of scrapping furnaces. But Mr. Roe in his London paper points out that the future diminution of hand puddling is not to come so much from the crowding out of puddled iron by steel or wrought scrap as from the disappearance of the puddler:

> Even with the wonderful increase in the production of steel during the last 40 years the production of wrought iron has not materially decreased, although relatively much less, and the oft prophesied disappearance of the puddle furnace seems as distant as at the time of the invention of the Bessemer process. Besides the uses which have determined this survival of puddling in the face of the vast flood of soft steel, excellent in quality, for many purposes, there is a large range in which wrought iron would be employed if it could be obtained at, or near, the price of steel. This is peculiarly true of those uses in which sudden or continuous shocks are to be withstood, or in which the material is to be exposed to the action of corrosion.

especially in light sections, such as wire or roofing sheets. The investigations of the United States Agricultural Department, although not yet sufficiently completed for a definite pronouncement, seem unquestionably to point to a life for iron fencing wire about three times as long as for that which is made from steel. Undoubtedly also the opinion is spreading among engineers and intelligent consumers that wrought iron, when of good quality, is better than soft steel for many of the uses in which the latter is now almost exclusively employed on account of its cheapness and the abundant supply.

There is, however, one cause which is slowly undermining the ordinary puddling process, and which may eventually even bring about its final downfall. This is the strong disinclination of the intelligent workman of to-day to undergo the excessive labor demanded by puddling. A man with intelligence enough to make a good puddler can usually make as much money in other ways and with less bodily strain, and more and more of them are refusing to take up the trade. This is not a fanciful assertion, and I have heard of plants which had to be abandoned because a new generation of puddlers could not be educated to take the place of those who were passing away.

It has been predicted that the result of the more aggressive recent campaign in behalf of iron will be its larger use in particular lines of service. But it has been the usual thing to say in this connection that if the slag-protected iron of the puddling furnace is demanded the user must be prepared to pay the higher price that goes with small outputs of hand-made products. If, now, the supply of puddlers is diminishing at a time when special effort is being made to enlarge the field of iron, a situation is created in which the commercial success of mechanical puddling becomes a factor of first importance. To secure for the iron rolling mill the economies accompanying the rapid and continuous handling of large tonnages in steel works, and thus to put the manufacture of iron on a plane with that of steel, is an achievement that may well be called revolutionary.

Lesson of a Machine Tool Auction.

The auction sale of more than $100,000 worth of machine tools at Lowell, Mass., last week, demonstrated that the builders of this class of machinery are by no means above the market in their prices and that the demand not only continues strong, but promises to remain so for a long time to come. Users of machine tools will do well to take a lesson from the result of this sale. When second-hand tools sell at auction at a premium above the quoted prices of new tools, and very much above the prices at which they were bought scarcely a year ago, it seems hopeless to wait for a turn in the market before making contemplated purchases. To be sure the machines sold had been operated but a short time, yet a machine which has been set up in a factory and has been used possesses for the new owner a certain element of risk. While many of the tools did not bring the current quoted prices, they brought under the hammer more money than they had cost in a lower market. It was agreed by those who followed the auction, among whom were many of the most successful users of machine tools, as well as builders and dealers, that the prices received were without precedent for a forced sale. Hence they reason that wise buyers will realize the conditions thus brought to the surface.

The consolidation of 14 companies into the St. Louis Hydraulic Pressed Brick Company is announced at Cleveland, Ohio. The capital stock of the company will be increased from $3,500,000 to $10,000,000, the new stock to be exchanged for the stock of the other companies. In addition to the Cleveland Hydraulic Pressed Brick Company, South Park, Ohio, the other companies absorbed are located at Cleveland, Toledo, Findley and Zanesville, Ohio; Kansas City and Chanute, Kan.; Kansas City, Mo.; Chicago, Ill.; West Superior, Wis.; Minneapolis, Minn.; Omaha, Neb.; Rochester, N. Y.; Washington, D. C., and Philadelphia, Pa.

The Steel Corporation's Quarterly Statement.

The report of the United States Steel Corporation for the quarter ending June 30, 1906, shows net earnings of $40,125,033, being the largest quarterly net earnings in the history of the corporation. Never before did the figures go above $40,000,000. The highest amount heretofore attained was $37,662,058 for the second quarter of 1902. The income account for the past quarter is as follows:

Net earnings April, 1906	$12,581,902
May, 1906	14,041,601
June, 1906	13,501,530
Total net earnings after deducting, each month, the expenditures for ordinary repairs, renewals and maintenance of plants, employees' bonus funds, and also interest on bonds and fixed charges of the subsidiary companies	$40,125,033
Less appropriations for subsidiary sinking funds, depreciation and reserve and special improvement funds	8,652,045
Balance of net earnings	$31,472,988
Deduct interest for quarter on U. S. Steel bonds and sinking funds for quarter on corporation bonds	6,936,963
Balance	$24,536,025
Dividend for the quarter on preferred stock	6,304,919
Surplus for the quarter	$18,231,106
Less appropriated from surplus for expenditures made and to be made on authorized appropriations for additional property, construction and discharge of capital obligations	13,000,000
Balance of surplus for the quarter	$5,231,106

The appropriation from the surplus, $13,000,000, compares with a similar appropriation of but $10,500,000 for the previous quarter. As the total surplus March 31 was $84,165,710, the addition of $5,231,106 brings the total up to $89,396,816.

Unfilled orders on hand June 30 were 6,809,589 tons, against 7,018,712 tons on March 31 and 7,605,086 tons on December 31.

Postal Changes in Aid of Pan-British Trade.

At the sixth congress of chambers of commerce of the British empire, held in London, England, July 10, 11 and 12, in connection with the adoption of the resolution favoring mutually preferential tariffs, referred to in *The Iron Age* of July 26, the mover, George E. Drummond, Montreal, spoke of the importance of calling a colonial conference in 1907 to give effect to the desire to make Canada an independent nation permanently allied to Great Britain. A resolution was adopted urging the making of such rates of postage by the British Government as will encourage the circulation of British newspapers and periodicals in all parts of the empire and thus promote trade unity. It was stated that Canada is inundated with American literature to the detriment of British commerce as well as of sentiment; that while it costs $184 to send a ton of British literature to Canada, it costs only $12 to send a ton of Canadian literature to Great Britain; also that it is cheaper to send a parcel by mail from Great Britain to Japan via Canada than to Canada direct for delivery there. A resolution was adopted recommending that colonial post office departments adopt uniform rates of postage for parcels post, the same as now exist between Great Britain and New Zealand. This proposal met with opposition from the delegate of the Canadian Manufacturers' Association, who said that it would make the post office a cheaper means of delivery of goods than any other. Other resolutions adopted declared for universal penny postage as likely to promote international trade, recommended that steps be taken to establish uniform patent and copyright laws and insolvency laws throughout the empire, favored the promotion of technical and commercial education and the arbitration of international commercial and labor disputes, and recommended that Canadian railroads receive imperial consideration in any plan for imperial federation and defense.

It may be recalled that Canadian delegates to a similar congress in 1905 strongly urged that some steps be taken to reduce the supply of American trade literature

entering Canada. The reason given was that information concerning American products is too plentiful in Canada.

PERSONAL.

H. R. Barnhurst, formerly of the Stearns Mfg. Company, Erie, Pa., has become assistant general manager of the Wilkins-Challoner Company, Oshkosh, Wis.

Arthur W. Taylor, for a number of years in charge of the laboratory of the Otis Steel Company, Cleveland, has become assistant superintendent of the open hearth department of the Colorado Fuel & Iron Company, Pueblo, Col.

W. H. Scobie, for many years assistant purchasing agent of the Big Four Railroad at Cincinnati, Ohio, has resigned and has accepted a position as purchasing agent of the Pittsburgh Gage & Supply Company, Pittsburgh.

F. A. Lathrop, for the past two years with the Mark Mfg. Company, has become associated with L. B. Jenks, who has charge of the Chicago office of the Youngstown Sheet & Tube Company. Mr. Lathrop was connected with the National Tube Works Company up to the time of the merger and for five years thereafter with the Western Tube Company, Kewanee, Ill.

Henry M. Howe and Bradley Stoughton have formed a copartnership for consulting practice in metallurgy, with offices at 27 West Seventy-third street, New York City.

At Buckingham Palace on July 27 King Edward received the representatives of the American Institute of Mining Engineers. Those presented were Robert W. Hunt, R. W. Raymond, C. Kirchhoff, Walter Wood, Joseph Hartshorne, Theodore Dwight, B. F. Fackenthal, Jr., and Oberlin Smith. The Americans were accompanied by the officials of the Iron and Steel Institute. The Bessemer Medal was presented to the King, who expressed his pleasure at receiving it from the representatives of such an important industry.

J. W. Cregar, formerly the proprietor of the J. W. Cregar Agency, The Bourse, Philadelphia, Pa., announces that the agency has retired from business and that he has accepted a position in charge of the miscellaneous department of the Niles-Bement-Pond Company in Philadelphia.

Tom Cobb King has resigned as vice-president and general manager of the National Metallurgical Company, 43 Exchange place, New York. About September 1 he will open an office as a metallurgical engineer in the Whitehall Building, 17 Battery place. At present Mr. King is in Canada in connection with professional work.

John F. Finnerty, for several years night superintendent of the plant of the Sligo Iron & Steel Company, Connellsville, Pa., has resigned to accept a similar position at the mills of the Shenango Iron & Steel Company, Wheatland, Pa.

W. H. Crehan, formerly with the Youngstown Sheet & Tube Company, Youngstown, Ohio, has resigned to accept the position of manager of large tube mills located at Montreal, Canada.

James Kearns, formerly superintendent of the Struthers Works of the American Sheet & Tin Plate Company, at Struthers, Ohio, has been transferred to the auditing department in the general offices of the company, Frick Building, Pittsburgh.

C. B. Harris has been made night superintendent of the sheet mill of the Youngstown Sheet & Tube Company, Youngstown, Ohio. J. F. Brown, who formerly held this position, has been transferred to the new Bessemer steel department.

Alexander Thomas, secretary of the Crucible Steel Company of America, Pittsburgh, has sailed for Europe.

Charles H. Zug, president of the Zug Iron & Steel Company, Pittsburgh, will sail for Europe August 14 to be gone two months.

John Farquhar has resigned as secretary of the Lackawanna Steel Company, and F. F. Graham, formerly assistant secretary, has been appointed to succeed him.

OBITUARY.

ALBERT W. FIERO, one of the foremost testing engineers of the country, member of the firm of Robert W. Hunt & Co., Chicago, died at the Battle Creek Sanitarium, Battle Creek, Mich., July 28. His first experience as an engineer of tests was had while in the employ of the Peninsular Railway, and in 1880 he represented the Chicago & Alton, the Chicago, Rock Island & Pacific, the Atchison, Topeka & Santa Fé, the Union Pacific and other roads as inspector of rails. In 1888 he engaged with Robert W. Hunt of Chicago and John J. Cone of New York in founding the firm of Robert W. Hunt & Co. He resided in Joliet until two years ago, when he removed to Chicago.

CHARLES ADDISON BRAGG, district office manager of the Westinghouse Electric & Mfg. Company, Philadelphia, Pa., died July 29, aged 56 years. He was born in Missouri, was graduated from Yale College and was one of the pioneers in the electrical business, having been associated with the United States Electric Lighting Company as early as 1882. His connection with the Westinghouse Company began in 1889, when he was made manager of the Philadelphia office.

The American Boiler Manufacturers' Convention.

The annual convention of the American Boiler Manufacturers' Association will be held in the Hotel Schenley, Pittsburgh, for three days commencing September 18. At a meeting held in Pittsburgh, July 26, an Executive Committee was appointed consisting of George N. Riley of the National Tube Company, Pittsburgh, chairman; Robert Munroe, Jr., boiler manufacturer of Pittsburgh, treasurer; H. W. Bateman of the Lukens Iron & Steel Company, Coatesville, Pa., secretary, and W. O. Duntley of the Chicago Pneumatic Tool Company, general manager. Other members of the committee consist of A. P. Head of the Otis Steel Company, Cleveland; J. D. Farasey, Cleveland; James Lappan and Thomas Rees, boiler manufacturers, Pittsburgh; W. L. Hirsch of the American Steel & Wire Company, Pittsburgh, and J. T. Corbett of Jos. T. Ryerson & Son, Chicago. This committee will have full charge of matters pertaining to the affairs of the convention. A Committee on Entertainment was also appointed, of which W. O. Duntley of Chicago is chairman, and also a Ladies' Entertainment Committee, of which Mrs. Capt. Thomas Rees is chairman.

The Shenango Steamship Company, an identified interest of the Shenango Furnace Company, Pittsburgh, of which W. P. Snyder is president, has placed a contract with the Great Lakes Engineering Works, Detroit, Mich., for an ore boat 574 ft. long and 58 ft. beam, to be delivered about April 15, 1907, and thus be ready for use in the ore trade next season. This is the second boat to be built by the Shenango Steamship Company. The first is the W. P. Snyder, which has made highly creditable records, both in hauling ore and for time made between Cleveland and Duluth.

The Court has ordered the plant of the Neafie & Levy Shipbuilding Company, Philadelphia, Pa., to be sold at auction at a date not yet decided upon. The upset price has been fixed at $300,000. All of the company's uncompleted contracts will be turned over to the purchaser, with the exception of the United States cruiser St. Louis, nearly completed.

State Superintendent of Insurance Otto Kelsey, Albany, N. Y., has made public a tabulation of the sworn statements as of June 30, 1906, made by all fire insurance companies doing business in the State of New York. These statements show that the net loss in the San Francisco conflagration of last April of the companies reporting was $132,823,067.

Mexican Industrial Notes.

Mexican Labor Unions.

DURANGO, July 25, 1906.—A recent meeting of delegates held in the capital, who represented a large number of men engaged in an important branch of industry—that of cigar making in the southern part of the country—has brought into notice the fact that the workingmen of Mexico, who until very recently occupied an exceedingly inferior position in the community, and who were entirely without organization for the betterment of their condition, are beginning to associate themselves in societies with that object in view. From the report of the deliberations of these workers it would appear that their ideas as to the function of a union, at least at present, differ in a very marked degree from those which one is accustomed to associate with trade and labor organizations in other countries. The leading speakers impressed upon their associates the necessity which existed for a higher standard of education among the workingmen, affirming that it was only by the acquisition of greater knowledge that the workmen of Mexico could hope to raise themselves to a higher level than that which they now occupy. There was no note of aggression, no word of menace to capital in the whole proceedings.

Associations of workmen in many lines of labor have existed in Mexico for several years, but the occasion here spoken of was the first instance in which delegates met representing allied workers from different parts of the country. The aims of these associations are entirely benevolent; so far the labor agitator and the walking delegate are unknown. The recent labor troubles in the mining camp of Cananea arose from an altogether different cause, and should not be confounded with trade unionism, which in Mexico to-day is solely and simply an educational and benevolent institution.

Railroad Concessions and Construction.

The Tehuantepec National Railway, which has for so long a time been under reconstruction and betterment, will be opened to interoceanic traffic not later than the first of the new year.

An English company purposes constructing a line from San José del Sitio, in Chihuahua, to the mining camp of Parral, and thence to a connection with the Kansas City, Mexico & Orient.

The Mexican Central Railway Company intends to let three important contracts for construction between the present time and the close of the year. These are for the short line to the port of Tampico, the Maifil-Guanajuato line, and for the 120 km. branch from Colima to Autlán.

The Jalisco & Michoacan Railroad Company, which holds a concession for a line between Guadalajara and Patzcuaro, in Michoacan, is said to have transferred its interests to New York capitalists, who will furnish the funds necessary to carry out the undertaking.

An automobile line for passengers and freight—the first venture of the kind in Mexico—is soon to be established between the city of Guadalajara and Chapala. Ernesto Mora, of the city named, has made a contract with the Governor of the State for the building of a road for the purpose, to remain in force for 90 years.

Industrial Notes.

Imports into the Republic in nine months of the current fiscal year for which statistics are published, show a total value of $153,508,730.84, as compared with $132,450,590.64 in the corresponding months of 1904-1905. The imports under the first total included: Machinery and apparatus, $14,194,279.98; vehicles, $3,019,174.05; arms and explosives, $2,946,736.20.

The railroad companies engaged in constructing new lines have found much difficulty in procuring a sufficient force of track laborers. Large numbers of foreigners, including Chinese, Japanese and Turks, have recently come into the country for this work, and others have been contracted for.

A company has been formed by Mexican capitalists, with headquarters at Mazatlan, to operate a line of freight steamers between the Pacific ports of San Blas, Acapulco, Salina Cruz, &c.

Persons in Mexico who are in the market for structural material find difficulty in placing their orders with hope of an early delivery, the Mexican mills being overburdened.

The Monterey steel plant is again in full operation, after a partial stoppage on account of shortage of coke.

Frank Lake, Guadalajara, has obtained a concession from the State Legislature to erect a plant for the manufacture of automobiles.

During the present fiscal year automobiles have been imported from the United States valued at $500,000.

E. R. Dalbey & Co. is the style of a new firm at No. 7 1A Calle de San Francisco, Mexico City, engaged in handling mining machinery and supplies.

The Mexico Mine & Smelter Supply Company of the City of Mexico has added an extensive line of hardware to its other business.

The following companies and individuals have applied for water rights for the purposes given: G. & O. Braniff & Co., City of Mexico, to use 13,000 liters per second from rivers in the State of Nuevo Leon to generate electric power for industrial purposes; W. W. Wheatley, president of the Perico Exploration Company, to use 1000 liters per second from the River Coblanes, State of Jalisco, for motive power in mining operations; William Storms, to use water from the Rio Blanco, in Nuevo Leon, for generating electrical power, and Carlos Izquierdo to utilize a waterfall near Mascota, in the State of Jalisco, for the electric lighting of the town. J. J. D.

Recent Customs Decisions.

Steel Wool.

The Treasury Department has again met with defeat in its attempt to levy a high duty on steel wool. The latest decision, adverse to the contentions of the Government, was handed down July 27 by the Board of United States General Appraisers. While the decision of the board is not unanimous, the material is granted the lower duty under the provision in paragraph 135 of the tariff law, for steel in all forms and shapes not specially provided for, as against the classification imposed by the collector of customs as manufactures of metal, with duty at the rate of 45 per cent. Paragraph 135 makes the duty 3-10 cent per pound up, according to valuation. In view of the fact that the board's decision is not unanimous, and in the hope that the Circuit Court will reverse the board, as well as its own previous decision, it is regarded as probable that the Government will carry the suit to the upper tribunal.

Horseshoe Calks.

General Appraiser Fischer wrote a decision for the Board of Appraisers July 28, denying a contention raised by Maldanado & Co., New York, it being held that steel horseshoe calks are dutiable at the rate of 45 per cent., under the provision in the tariff law for manufactures of steel. Two claims were made by the importers, one being at the appropriate specific rate according to their value per pound, under paragraph 135, or at 2¼ cents per pound, under paragraph 161. The board says that the articles are the result of a somewhat elaborate manufacturing process. They are made from steel bars, and from their condition as steel they have passed into articles with distinctive names, character and use other than what were possessed by the material from which they were made.

Steel Strips.

At the request of Hermann Boker & Co., New York, and of the Government counsel, the Board of Appraisers July 28 handed down a decision affecting the classification of steel strips imported by the firm. The precise question is now pending in the United States Circuit Court, but the parties concerned did not care to await the outcome of the judicial proceedings in the higher tribunals. The Government assessed an additional duty of 1 cent. per pound on the strips, on the ground that the strips are brightened or polished.

NEWS OF THE WORKS.

Iron and Steel.

The Fort Wayne Rolling Mill Company, Fort Wayne, Ind., is adding to its plant two additional gas producers and two additional 125-hp. waste heat boilers to its steam equipment. The company is also adding one additional puddling furnace.

The Indiana Rolling Mill Company, New Castle, Ind., will install a few additional presses in its disk department for cutting out all kinds of agricultural shapes. The company recently put in grooved rolls in its rolling mill department and is now making plow steel of all kinds up to 8 in. in width.

Frank C. Roberts & Co., Philadelphia, Pa., are preparing plans for the new blast furnace to be erected for the Hamilton Iron & Steel Company, Hamilton, Ont. The new stack is expected to be ready for blast in the spring of 1907. This engineering firm is now at work upon Gayley dry blast plants for Guest, Keen & Nettlefolds, Limited, Cardiff, Wales; Warwick Iron & Steel Company, Pottstown, Pa., and the E. & G. Brooke Iron Company, Birdsboro, Pa.

The New York State Steel Company's plant, at Buffalo, N. Y., is making rapid progress toward completion, the steel framework for the blooming mill and soaking pit buildings being practically finished; also the power house and a considerable quantity of machinery is in place. The foundation for the Talbot open hearth furnaces is finished, and the framework for them will be started at once. It is expected that the company will commence rolling billets in about 90 days. The capital stock has been increased from $1,000,000 to $2,500,000.

General Machinery.

The Sway Back Mining Company, Webb City, Mo., has let contract to Wigginton & Milton, of that place, for the equipment of a new 300-ton concentrating plant. The power used will be one 100-hp. Elyria gas engine to drive the mill proper and one 160-hp. Elyria gas engine to drive an Ingersoll-Rand compressor of 1056 cu. ft. capacity. The compressor will drive 12 Ingersoll air drills.

Willis Shaw, Chicago, Ill., has issued a list of second-hand machinery in stock, including standard gauge locomotives, dump cars, steam shovels, stone crushers, road rollers, stone saws, planers, rock drills, channelers, concrete mixers, hoisting engines, pumps, boilers, cranes and derricks, air compressors, spreaders and unloaders, steam pile drivers, track engines, &c.

The T. B. Wood's Sons Company, Chambersburg, Pa., manufacturing engineer, is erecting a one-story brick building, 100 x 450 ft., to be used as a foundry and machine shop. The equipment has been purchased.

C. Word, president of the Canadian Cobalt Company, Cobalt, Canada, a concern connected with the Canadian Government, spent the past week in Pittsburgh purchasing hydraulic machinery for the operation of the mines there.

The W. B. Osborn Machinery Company, Clarksburg, W. Va., dealer in engines, boilers, pumps and machinery, is adding a line of mill and mine supplies to its regular machinery and power equipment business.

It is stated that the syndicate which has acquired the Brown machine shop at Pawtucket, R. I., and which will manufacture textile machinery, as stated in this column last week, will operate under the name of the James Brown Machine Company. The corporation, which has been in existence for some time, but which has not manufactured of late, has an authorized capital stock of $300,000, which will probably be increased later. The personnel of the new owners is not yet revealed.

The Payne & Joubert Machine & Foundry Company, Birmingham, Ala., has recently increased its capital stock from $100,000 to $150,000, in order to carry out its original intention of having one of the best equipped plants in the country. The company expects to begin active operations about the middle of August, and will start out with a full complement of orders, consisting of sugar house machinery and work for furnaces.

The American Car & Foundry Company, St. Louis, Mo., has taken out a permit to build a concrete machine shop at Wilmington, Del., to cost $5000.

The Betts Machine Company, Wilmington, Del., is building an extension, 30 x 90 ft., to its machine shop, and is building an addition to the erecting shop, 40 x 120 ft., of steel construction, which will be equipped with a traveling crane and machine tools, all of which have been purchased.

Power Plant Equipment.

The Falk Company, Milwaukee, Wis., is erecting a new power house, 80 x 100 ft. Contracts have been let for the following equipment for installation therein: One cross compound Reynolds Corliss engine, direct connected to a 500-kw. Bullock generator; one Corliss compound two-stage air compressor and condenser; one circulating pump; one switchboard with instruments; three Wickes vertical boilers of 300 hp. each. The company manufactures switches, frogs and crossings, motor gears and pinions, steel castings, &c.

It is given out that the Windsor Locks Electric Lighting Company, Windsor Locks, Conn., and the Enfield Gas Company, have been consolidated as the Northern Connecticut Light & Power Company, and that the plan is to erect a new electric light plant at Windsor Locks and a new gas plant at Thompsonville.

The Dayton Globe Iron Works Company, Dayton, Ohio, has received contract for a large shipment of machinery to the plant of the Trade Dollar Consolidated Mining Company, on Snake River, near Silver City, Idaho. The contract includes four of the largest size water wheels which this company builds, together with all of the power transmission machinery required for the development and transmission of over 3000 hp.

Henry J. Schmeck and Henry L. and Harvey C. Johnson have entered into a limited partnership under the name of the Hamburg Mfg. Company, Hamburg, Pa. The company builds hoisting engines.

Contracts were awarded last week for the erection and installation of the new $500,000 power plant for the Railway Steel Spring Company, at Latrobe, Pa. The main power building will be 71 x 255 ft. and will house a complete electric generating plant, which will be sufficient to run the mills now there and additional mills that will possibly be built within the next few years.

The Improved Boiler Feed Company, Denver, Col., has been incorporated to introduce a new boiler feeding device invented by W. A. Moffatt of that city. B. R. Graham, Ernest-Cranmer Building, is interested.

The Wells Building Company, Milwaukee, Wis., which is erecting the new Stephenson Building at that place, has let contracts for the isolated power plant which will serve the building. The entire lay-out, as specified, will comprise six Allis-Chalmers engines, direct connected to Allis-Chalmers generators having an aggregate capacity of 3000 kw. The boilers are of the Aultman-Taylor Company's Cahall type, provided with the McKenzie Furnace Company's Dutch ovens, each 500 hp.; a boiler unit being provided for each engine and generator unit. This plant will be operated in conjunction with the power plant of the Wells Building for furnishing light, power and heat used in the two buildings.

The Alliance Machine Company, Alliance, Ohio, has been awarded the contract for cranes to be installed in the addition to the Ensley plant of the Tennessee Coal, Iron & Railroad Company, consisting of two 100-ton four-girder type ladle cranes and two 45-ton and two 20-ton standard cranes. The company has also been awarded the contract for a 30-ton double trolley crane by the Pittsburgh Steel Construction Company for the extension to its plant at Economy, Pa.

Foundries.

The Albion Malleable Iron Company, Albion, Mich., manufacturer of malleable iron castings, is to erect a new foundry, to contain six melting furnaces, which will double the present capacity, giving it an annual output of from 15,000 to 18,000 tons of finished castings. About 300 molders will be given employment in the new foundry, which it is expected will be completed by December 1. W. S. Kessler is president and general manager; H. B. Parker, vice-president and assistant general manager, and M. B. Murray, secretary and treasurer.

The New Process Steel Company, Marshall, Mich., recently organized, will erect a plant for the manufacture of crucible steel castings for automobiles, gas engines and machinery which require great strength and durability. The buildings will include a one-story foundry, 60 x 123 ft., with office addition, 15 x 20 ft., and sand and scrap sheds, 12 x 50 ft. Contracts for the erection of the buildings have been let and the company hopes to have the plant in operation about September 1. S. F. Dobbins is president; F. A. Stuart, vice-president; S. C. French, secretary and general manager, and C. E. Gorham, treasurer.

The N. & S. Foundry Company, Seattle, Wash., is a reorganization of the Seattle Foundry Company, formed in April. The capital stock of the new company has been increased to $30,000. A foundry building, 45 x 85 ft., and an office and pattern storage building, 30 x 50 ft., will be built as soon as the plans can be prepared.

At the annual meeting of the stockholders of the Youngstown Foundry & Machine Company, held on July 24, all of the officers and the following Board of Directors were elected: Thomas Parrock, W. J. Wallis, A. E. Adams, E. Hartzell, S. K. Hine, R. Montgomery and J. J. Kennedy. The company reports a very prosperous year and an excellent outlook for the future.

The Avonmore Cast Steel Company, Avonmore, Pa., has about completed the improvements at its plant and will have it in full operation within a few weeks. Several new buildings have been added, and the old buildings and machinery completely overhauled. The company is also building a large number of houses for the employees.

The E. F. White Brass Company, Stamford, Conn., has been incorporated under Connecticut laws to manufacture brass and bronze castings. E. F. White is president and treasurer, and R. A. Allison vice-president and secretary. The company will make all compositions of copper, especially brass and bronze castings and babbitt metal. The plant is located at Stamford.

The foundry business formerly conducted by L. H. Wells, Worcester, Mass., has been acquired by a new corporation known as the Wells Chemical Bronze Works, with capital stock of $5000. The officers are: President, Thomas A. Callahan;

treasurer and clerk, Frank C. Harrington; directors, these officers and Mary A. Callahan. The company will manufacture castings of brass, manganese bronze and other composition metals.

Bridges and Buildings.

McCreary & Willard, Spokane, Wash., have been awarded contract by the Oregon Railroad & Navigation Company for the construction of all bridges along its line during the ensuing year. The contract contemplates a steel bridge across the Hood River; a steel bridge, 710 ft. long, across the Sandy River, near Troutdale; steel bridge, 420 ft. long, across the Umatilla River at Umatilla; 300-ft. steel bridge across the Umatilla River at Pendleton; 450-ft. steel bridge across the Des Chutes River at Des Chutes; steel bridge, 175 ft. long, across the Walla Walla River at Wallula; 100-ft. steel bridge across the Burnt River near Huntington.

Fires.

The Atchison, Topeka & Santa Fe Railway Company's shops at Olinda, Kan., were damaged $10,000 by fire on July 4.

On July 27 a fire did $4000 damage to the brass foundry of William Duncan, East Boston, Mass.

The Philadelphia Carriage Bolt Works, Philadelphia, Pa., were burned last week. The loss is placed at $15,000.

The United Machinery Company, Boston, Mass., has incorporated the Wheeling Nail Company with a capital stock of $20,000, to operate its large nail plant at Wheeling, W. Va.

The plant of the Echo Bicycle & Motor Boat Works was destroyed by fire July 30. The main building, 400 ft. long, containing automobile and bicycle supplies and a number of motor boats, was entirely consumed. Loss, $10,000.

The Sheffield Stove Works, Sheffield, Ala., were burned July 25, the loss being about $15,000.

Hardware.

The Atwater Mfg. Company, Southington, Conn., manufacturer of carriage makers' hardware, wrought ox shoes and other specialties, is making extensive changes in its factory. The machine room will be moved from the first floor to the second and the vacated space will be taken over for a finishing room. New machinery will be added to both machine and finishing rooms, and new drops to the forge room. The changes will add greatly to the capacity of the works, the larger manufacturing facilities having become necessary not only because of the general increase in business, but because of special work in forgings which the company has taken up during the past year. If the company continues as busy during the coming year as it is to-day an additional building will have to be erected.

The Elmore Mfg. Company, Southington, Conn., manufacturer of small tools, has purchased the stock, tools and good will of the Schatz Hardware Mfg. Company, manufacturer of screw drivers, Chappaqua, N. Y., and will manufacture the latter line at its factory at Southington.

The William B. Durgin Company, Concord, N. H., manufacturer of silver ware, has purchased the business of Goodnow & Co., formerly Goodnow & Jenks, manufacturers of high class sterling silver ware, Boston, Mass. The business will be consolidated with that of the Durgin plant at Concord. No enlargement of the works will be required for the present.

The Waterbury Tent Company, Waterbury, Conn., has been reorganized and incorporated under Connecticut laws with capital stock of $25,000. The incorporators are H. H. Peck, Henry Weyand, F. L. Andrews, M. E. Keeley and D. F. Cronin. The company will manufacture portable tents.

The Ohio Nut & Bolt Company, Berea, Ohio, has been running its plant 13 hours per day since March 1, and expects to run a double shift during the fall and early winter. The company's present plant is filled to the limit with machinery, and to meet the increasing demand the company is contemplating the erection of another building double its size. The company manufactures stove bolts, stove rods, sink bolts, tire bolts, machine screws, cold pressed nuts, rivets, &c.

The Horton Mfg. Company, Bristol, Conn., manufacturer of the Bristol steel fishing rod and other tackle, is to erect a three-story brick addition to its plant, 40 x 120 ft. The addition is made necessary by the material increase in the company's business.

The Noera Mfg. Company, Waterbury, Conn., manufacturer of hardware specialties and bicycle and automobile sundries, has acquired the plant of the Rogers & Hamilton Company of that city. This is now being overhauled and the Noera Company expects to take possession in about a month. The new quarters will materially enlarge the company's manufacturing facilities.

The business of F. E. Spencer & Co., New Haven, Conn., manufacturers and dealers in paints, oils and naval stores, has been incorporated in Connecticut with capital stock of $25,000. The incorporators are Francis E. Spencer, George M. Eckle and E. P. Arvine.

The Dikeman Mfg. Company has established a factory at Norwalk, Conn., for the manufacture of mechanics' tools, screw machine products and specialties in sheet metal, either steel, brass or copper. C. S. Dikeman, formerly of the Eagle Bicycle Company, Torrington, Conn., and later with the American Brass Company, is the president and J. S. Dikeman is the treasurer. The company has completed the equipment of its works and is manufacturing.

The F. A. Black Mfg. Company, which is building a new cutlery plant at Scottdale, Pa., announces that the plant is about completed, and that a small force of men is now at work manufacturing the knives which will be the principal product of the company. The output at the start will be confined entirely to pocket knives, but in the near future it is the intention to manufacture all lines of cutlery.

The Garland Rivet Works, West Pittsburgh, Pa., are being enlarged, and employment will be given to a large number of additional men.

The Standard Scale & Supply Company, Pittsburgh, has recently furnished a large number of railroad track scales for the Government navy yards located along the Atlantic Coast. One very large scale, for the Brooklyn Navy Yard, is of an improved style of construction as developed by the company. This scale is built with a third or "dead" rail, the improvement consisting of giving uniform support for this "dead" rail throughout the entire length of the scale pit, and also maintaining the live and "dead" rails at the same level on top of the scale platform. Some strong claims are made for these scales, and it was partly by this method of construction that the company has been able to secure so many Government orders. The company has also furnished a number of scales for the work on the Panama Canal.

F. E. Myers & Bro., Ashland, Ohio, are running their plants on full time and report a large demand for pumps, hay tools, barn door hangers, &c. Their new warehouse is almost completed, and after moving into it and readjusting the factory they will be in better position than ever before to take care of their increasing business.

Miscellaneous.

The Scott National Radiator Company, Marion, Ind., has increased its capital stock from $25,000 to $50,000.

The Indianapolis Composite Brick Company has been incorporated at Indianapolis, Ind., with $100,000 capital stock. It will build a factory in that city. Laurence Elkus is president; Louis Morgan, secretary.

The Universal Portland Cement Company has been incorporated at Gary, Ind., with $1,000,000 capital stock. The directors are Edward M. Hagar, Thos. J. Hyman, Eugene J. Buffington, Kemper K. Knapp and Elbert H. Gary.

The Premier Motor Mfg. Company, Indianapolis, Ind., has increased its capital stock from $100,000 to $200,000.

The Worth Mfg. Company has been incorporated at Evansville. Ind., with $100,000 capital stock, to manufacture automobiles. The directors are John C. Zutt, A. F. Karges, Willis M. Copeland, James M. Worth and Wm. O. Worth.

The Clare Coke Company, Greensburg, Pa., of which James A. Bennett of Greensburg is president and Lawrence E. Walters of Pittsburgh is secretary, has bought through Bair & Lane of Greensburg the Connellsville coking properties heretofore owned by Joshua W. Rhodes & Co., Pittsburgh, and operated by them under the name of the Penn Coke Company. The property comprises two plants of 50 ovens each, with complete equipment. The new owners will at once commence the erection of another battery of 50 ovens and will otherwise improve the property to its fullest productive capacity. The coke, which is chiefly foundry, has heretofore been marketed as Rhodes coke, but in the future will be sold as Clare coke.

It is expected that the contract for the large new addition, 130 x 508 ft., to the Lenior Car Works, Lenior City, Tenn., will be let this month and work commenced at once.

Collins & Wright, Pittsburgh, Pa., manufacturers of metal trimmings for glass work, have purchased seven lots, 20 x 100 ft. each, at Butler and Fifteenth streets, where they will spend about $25,000 in the erection of a new plant. They have sold their present plant, this being another instance of a firm being persuaded to move farther from the center of the city by the increased value of its property. No machinery is required.

The Belmont Iron Works, near Chester, has taken contracts for some of the structural material for the new shops of the Baldwin Locomotive Works at Eddystone.

The Franklin Mfg. Company, Syracuse, N. Y., has begun work on improvements to its automobile plant which will cost in the neighborhood of $50,000. There is to be erected a new five-story building, 65 ft. wide and from 100 to 130 ft. long, to connect with building C. It is to be used for general manufacturing purposes and will enable the company to increase its output to 2000 automobiles per year.

The Brown-Lipe Gear Company, Syracuse, N. Y., is building a large factory at Geddes and West Fayette streets.

The Rich & Lightburn Mfg. Company, Memphis, Tenn., has just made application for a charter with a capital stock of $30,000, to manufacture valves. The incorporators are George W. Rich, J. S. Lightburb, Gwynne Yerger, Charles C. Campbell and S. B. Anderson. The company has not yet secured quarters.

The Williams Automobile Company, Akron, Ohio, recently incorporated with $1,000,000 capital stock, is having plans pre-

pared by a Cleveland engineer for a large plant to be placed in operation next spring. It is starting work on new models in a temporary plant at Akron.

The Humane Horseshoe Company, Lima, Ohio, is erecting a new plant and has placed contracts with Cleveland machinery companies for a number of lathes, drill presses and other tools.

The Oscar Lear Automobile Company, Columbus, Ohio, has given up its previously announced plan of erecting a large plant at Zanesville, Ohio, and will remain in Columbus, where it will erect a new establishment giving it several times its present capacity. Preliminary plans for the plant are being prepared by a Cleveland engineering concern.

The Elmore Mfg. Company, Clyde, Ohio, manufacturer of the Elmore gasoline car, has commenced work on additions to its plant. Two two-story buildings, one 38 x 100 and the other 40 x 75 ft., will be erected immediately, and as soon as these are completed it will erect another building, 40 x 100 ft. and two stories high. The additions will increase the company's floor space by about 30,000 sq. ft., and it will install new machinery which will more than double its output next season.

The Akron Selle Company, Akron, Ohio, has commenced work on a large addition to its plant. The building will be in two sections, each 50 x 150 ft. and five stories high, of slow burning brick construction. The company some months ago purchased the plant and business of the National Gear Company, Ravenna, Ohio, and the machinery will be removed to the new Akron plant. Considerable new woodworking machinery will also also be installed.

The Winfield Mfg. Company, Warren, Ohio, has been reorganized and the capital increased to $100,000. The following officers have been elected: W. C. Winfield, president and superintendent; R. A. Cobb, vice-president; G. W. Byard, secretary, and J. H. Ewalt, treasurer. R. A. Cobb, who has acted in the capacity of secretary and general manager for the past 25 years, has retired from the active management of the company owing to increased business interests elsewhere. The company has purchased the plant of the Warren Sheet Metal Company, which adjoins the Winfield factory, and this will be fitted up for the manufacture of stove pipe elbows, galvanized mail boxes and other new lines which will be taken up in addition to the manufacture of oil cans and lanterns, heretofore the company's principal products.

The Chattanooga Boiler & Tank Company, Chattanooga, Tenn., is building two large McClure stoves for the Republic Iron & Steel Company, Thomas, Ala.; 14 x 150 ft. stand pipe for the United States Cast Iron Pipe & Foundry Company, and a water tower tank of 2250 gal. capacity, having 75-ft. elevation, for the Keyser Mfg. Company, Chattanooga.

Two new Massachusetts corporations have been organized in connection with the new automatic sprinkler, the invention of George I. Rockwood, Worcester, Mass. The Rockwood Sprinkler Company is the holding company, with capital stock of $1000. The Worcester Fire Extinguisher Company will manufacture, under rights from the holding company, the sprinkler and other accessories of sprinkler systems, at the works already established at 2 Arch street, Worcester. The capital stock is $10,000. The officers and directors of both companies are: President and treasurer, George I. Rockwood; clerk, John P. Ashey, and C. D. Ashey. The works are very busy, it being necessary to run nights.

The Art Die Sinking Company, Providence, R. I., has taken the plant of Lang & Fisher, 144 Pine street, and will manufacture dies and tools, abandoning the line of die sinking machines which has been a part of the product of its predecessors. The officers are: President, Clinton W. Brown; treasurer, H. G. Possner, and secretary, Albert W. Possner.

A Pennsylvania charter has been issued to the Continental Furnace Company, Philadelphia. The capital is placed at 10,000, but is to be increased. The incorporators are: John B. Stevenson, 3rd, Abington, Pa., and Charles M. List and Edgar A. Custer, Philadelphia.

Clark & Co., Lansing, Mich., have started rebuilding their plant which was recently destroyed by fire. They have been able to repair a large number of the machines, and will only be in the market for a few machines made especially for carriage builders.

The new brass foundry and finishing shops of the Speakman Supply & Pipe Company, Wilmington, Del., have been placed in operation. The shops were constructed on modern lines and have been equipped with the latest improved machinery.

The Petroleum Automobile Engine Company, 120 Liberty street, New York, which was recently incorporated with a capital stock of $250,000, has secured the rights in the United States for the construction of the Secor engines for automobile purposes. The company will have a limited number of six-cylinder 50 to 60 hp. engines constructed for 1907. It does not intend to go into the manufacture of the engine, but to license the manufacture to others who are sufficiently equipped to properly supply the demand. Eli Teeter is manager.

The National Tool & Stamping Company, Wayne Junction, Philadelphia, manufactures specialties exclusively and to order only, such as punches and dies for drop forgings, trimming, shearing, blanking, forming, drawing, &c., special products of machine tools, forgings, stampings, springs, shells and formed or machined parts.

The Jefferson Union Company, Lexington, Mass., is manufacturing the Jefferson union and flange, which is adapted for oil, steam, water, gas and air and requires no packing.

The Delphos Can Company, Delphos, Ohio, is adding to its plant two buildings, one of which will be 60 x 200 ft. and the other 60 x 100 ft. A 75-hp. gas engine and a 100-hp. gas producer have already been purchased from the Fort Wayne Foundry & Machine Company. The company is also having machinery for the galvanizing plant, as well as eaves trough and conductor pipe machinery, made at different machine shops. Purchases will probably be made of an elevator, tank heater and possibly some other items.

J. T. Slocomb & Co., Providence, R. I., manufacturers of micrometer calipers and other tools, are to increase their shop by the addition of a second story, 61 x 90 ft., the construction being such as to admit of putting on two additional stories when the need of more room is again felt. No new machinery will be needed at present.

The Perry-Fay Mfg. Company, Elyria, Ohio, formed several months ago with $300,000 capital stock to manufacture screw machine products, has practically completed its new plant and will shortly commence operations. The main building is 52 x 200 ft., two stories high, and an L to the building is 40 x 100 ft. The engine room is 40 x 80 ft., in which has been installed a 160 hp. gas engine built by the Elyria Gas Engine Company. A large number of automatic screw machines built by the Cleveland Automatic Machinery Company are being delivered. The plant has case hardening, annealing and polishing departments, and the entire plant is protected from fire by automatic sprinklers. R. D. Perry is president; E. F. Allen, vice-president, and W. W. Perry, secretary-treasurer.

The Gould Company, manufacturer of hand, triplex and centrifugal pumps, Chicago, will erect a new building at Ohio and Franklin streets. It will be used largely for storage purposes and practically the only equipment to be installed will be an electric elevator and a heating plant. Electric power will be used for operating the machinery in the present factory.

The Nortmann-Duffke Foundry Company, Milwaukee, Wis., which recently purchased additional land, has erected a building and equipped it with hydraulic machinery, furnaces, tools, &c., necessary to manufacture all kinds of pressed, deep stamped and drawn steel specialties, such as seamless steel soda fountain shells, seamless steel tanks and shells and reservoirs for other purposes.

The Birmingham Iron Company, Birmingham, Ala., will extend the capacity of its business by the addition of another large coke oven battery. The contract for the construction has already been let to the Oak Hill Marble Works. The new ovens will be constructed by the latest and most improved manner at a cost of about $50,000.

Inland Steel Company Extensions.

At the annual meeting of the Inland Steel Company, held Tuesday, July 31, at Chicago, the capital stock was increased from $2,500,000 to $5,000,000 to provide for additions and improvements. The company recently acquired a tract of 50 acres adjoining its present property at Indiana Harbor, which has a lake frontage of 4000 ft. and excellent docking facilities, the channel being dredged to a sufficient depth for the docking of the largest lake ore carriers. The Laura mine on the Mesaba range, controlled by Alexis W. Thompson, formerly president of the Republic Iron & Steel Company, has also been acquired and Mr. Thompson was elected a director of the company. This year 200,000 tons of ore will be taken out of the Laura mine, and the output will be materially increased next season.

Plans are now being prepared by Arthur G. McKee, mechanical engineer, Cleveland, for two modern blast furnaces that will operate exclusively on basic iron for the company's open hearth plant. Modern ore handling equipment will be installed. Extensive additions to the finishing department are also contemplated, the nature of which has not yet been definitely decided upon.

A fifth open hearth furnace has just been completed, increasing the steel output to 500 tons daily. Another 50-ton furnace is to be added, and on the completion of the blast furnace plant the steel producing capacity will be still further increased.

The Iron and Metal Trades

Simultaneously with reports of a further access of strength in all the Pig Iron markets of the country comes the statement of the United States Steel Corporation, showing the largest quarter's earnings in its history. The record is signalized, too, by the action of the directors in declaring a dividend on the common stock, the first of the kind since December, 1903. Confidence in a prolongation of the existing prosperity in the Iron Trade has been reinforced by the remarkable showing of the corporation's statement, as well as by the actual market developments of the past month. Leaders in the trade now speak with less reserve concerning early 1907, after having for some time limited their predictions of good times to 1906.

The volume of orders on the Steel Corporation's books on June 30, 6,809,589 tons, is the largest mid-year total it has been able to report. July bookings were at a greater rate than the average for the first six months and were in excess of shipments for the month.

Pig Iron has been the feature of the week's market. In the East the buying movement in Basic Iron that was well under way a week ago carried the total purchases of the fortnight above 125,000 tons, some estimates reaching 150,000 tons. The remarkable fact about it is that consumers provided for their needs for the balance of the year with an advance between the first and the last buying of but 25 cents.

The Western situation in Steel making iron is indicated by the resumption of shipments of Bessemer Iron by the Steel Corporation from the Valleys to Chicago. Conservatism prevails, however, and it is expected that the Corporation's purchases of Bessemer Iron for the last quarter will be made at about 50c. above the $17.25 Valley basis of the last contract. A significant purchase is that of 15,000 tons of Bessemer Iron from an Ohio furnace for shipment to the International Harvester Company's South Chicago Steel plant.

Foundry Iron markets are advancing, with here and there a buoyant tendency, which may need restraining. Southern Irons are 25c. to 50c. higher, with $13.75 and $14, Birmingham, commonly asked. In the Buffalo district a further advance of 50c. was made and eastern Pennsylvania makers have marked up their figures.

Foreign Low Phosphorus Iron is now offered on the seaboard at a parity with domestic Iron. In Foundry Irons imports are not likely, but it is intimated that $1.50 more on the domestic price might open the gates.

Finished Material markets show unusual midsummer activity, distributed all along the line. At Chicago, railroads have entered large orders for Track supplies. Rail buying for the week has been light, but some export business was done with Mexico and Porto Rico. Car buying goes on steadily.

In its bearing on the Sheet situation the announcement that one Steel company has withdrawn from the Sheet Bar market is interesting.

A large order for 12-in. Line Pipe for western Pennsylvania adds to the already phenomenal tonnage of Pipe and Tube mills.

The immediate subject of speculation among manufacturers is the effect that will be felt upon deliveries, if the regular fall business is added to the unusual inflow of the summer months.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 1, 1906.	July 25, 1906.	July 3, 1906.	Aug. 2, 1905.
PIG IRON, Per Gross Ton:				
Foundry No. 2, Standard, Philadelphia	**$18.50**	$18.25	$18.25	$16.25
Foundry No. 2, Southern, Cincinnati	**16.50**	16.25	16.00	14.50
Foundry No. 2, Local, Chicago	**18.75**	18.50	18.00	16.50
Bessemer, Pittsburgh	**18.85**	18.60	18.35	15.10
Gray Forge, Pittsburgh	**17.35**	16.60	16.35	14.50
Lake Superior Charcoal, Chicago	**19.25**	19.25	19.00	17.00
BILLETS, RAILS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh	**27.50**	27.50	27.00	24.00
Forging Billets, Pittsburgh	33.00	33.00	33.00	25.00
Open Hearth Billets, Phila	29.00	29.00	29.00	26.50
Wire Rods, Pittsburgh	34.00	34.00	34.00	32.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
O. Steel Rails, Chicago	14.00	14.00	14.00	14.00
O. Steel Rails, Philadelphia	**16.75**	16.50	16.00	16.00
O. Iron Rails, Chicago	21.25	21.25	21.25	18.75
O. Iron Rails, Philadelphia	**21.00**	20.50	20.00	18.50
O. Car Wheels, Chicago	18.00	18.00	18.00	14.75
O. Car Wheels, Philadelphia	*16.50*	16.00	16.75	15.00
Heavy Steel Scrap, Pittsburgh	**16.50**	16.00	15.50	14.25
Heavy Steel Scrap, Chicago	13.00	13.00	13.00	13.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.63½	1.63½	1.63½	1.63½
Common Iron Bars, Chicago	1.66½	1.66½	1.66½	1.55
Common Iron Bars, Pittsburgh	1.50	1.50	1.50	1.55
Steel Bars, Tidewater, New York	1.64½	1.64½	1.64½	1.64½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.50
Tank Plates, Tidewater, New York	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Beams, Pittsburgh	1.70	1.70	1.70	1.60
Angles, Tidewater, New York	1.84½	1.84½	1.84½	1.74½
Angles, Pittsburgh	1.70	1.70	1.70	1.60
Skelp, Grooved Steel, Pittsburgh	1.57½	1.57½	1.57½	1.50
Skelp, Sheared Steel, Pittsburgh	1.60	1.60	1.60	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.40	2.40	2.40	2.20
Wire Nails, Pittsburgh	*1.80*	1.80	1.85	1.80
Cut Nails, Pittsburgh	1.75	1.75	1.75	1.80
Barb Wire, Galv., Pittsburgh	2.30	2.30	2.30	2.25
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	18.50	18.50	18.50	15.60
Spelter, St. Louis	**5.95**	5.90	5.87½	5.45
Lead, New York	*5.77½*	5.80	5.85	4.60
Lead, St. Louis	*5.65*	5.67½	5.80	4.55
Tin, New York	*37.40*	37.25	39.20	33.00
Antimony, Hallett, New York	**23.50**	23.50	23.00	14.00
Nickel, New York	45.00	45.00	45.00	40.00
Tin Plate, Domestic, Bessemer, 100 lbs., New York	$3.94	$3.94	$3.94	$3.74

Chicago.

FISHER BUILDING, August 1, 1906.—(*By Telegraph.*)

Increased strength is developed in the Iron and Steel trade from week to week, and the Pig Iron demand, notwithstanding the heavy purchases made by Western consumers during July, shows no indications of abatement. Malleable founders with contracts on their books running through the early months of next year have been buying heavily for first quarter delivery from a local furnace, at $18, and the total sales already aggregate close to 15,000 tons, in lots ranging from 500 to 6000 tons. The Iron market this week displays all the symptoms of an incipient boom and operators are abetting such an abnormal condition with sharp price advances. Southern and Virginia producers have marked up quotations 50c. a ton, and Northern furnaces have added 25c. A market for Spot Iron has also developed and sales of car lots of Southern grades are freely made at $14.50, Birmingham, for No. 2. Believing that the situation is favorable to an upward movement of considerable proportions, one merchant Iron interest endeavored to purchase 20,000 tons of Southern at $13.50, but the lowest price named on this tonnage was $14, and the deal fell through. The shortage of Steelmaking Iron is pronounced, and owing to the pressure on its Steel works the International Harvester Company this week purchased 15,000 tons of Standard Bessemer, for delivery during the next three months, from an Ohio furnace. The Illinois Steel Company is likewise in the market for a large tonnage, but up to the present has been unable to secure it from merchant stacks in this vicinity. In Finished lines, mill shipments continue to fall below specifications, and deliveries are being further deferred. The buying of Track material is of unprecedented proportions, one road having contracted for 60,000 kegs of Spikes, equivalent to 6000 tons, for 1907 delivery. Buying

of Splice Bars and Bolts is proportionately heavy and the difficulties now being experienced in securing material make the railroads eager to secure favorable positions on next year's order books. The Republic Iron & Steel Company has announced its withdrawal from the Sheet Bar market, and independent Finishing mills will experience still greater difficulty in securing raw material.

Pig Iron.—Heavy sales at advancing prices continue to characterize the Iron market. Spot Iron is scarce, and stocks in both foundry and furnace yards are low. Sales of Malleable Bessemer through the first quarter of next year at prices 75c. a ton less than now prevailing are being made by a local furnace, and consumers are anxious to cover their needs through this period. Price advances of 50c. a ton have been made on Foundry and Basic by Southern and Virginia furnaces, and Northern Foundry and Malleable have been marked up 25c. Virginia operators report heavy sales of Basic at $16.50 at furnace, a large portion of this tonnage having been diverted from the South, owing to the scarcity of this grade in that section. Owing to the labor scarcity in Alabama production has been curtailed, and consumers not securing their regular quotas as required are taking in spot Iron at advances of 50c. a ton over prevailing quotations. On Foundry Iron the Iroquois Iron Company is out of the market for the remainder of the year, and the Republic and Tennessee interests have only a small tonnage for disposal. The Sloss-Sheffield Steel & Iron Company has re-entered the market on the $14 basis, and has already taken on considerable tonnage. We quote as follows, f.o.b. Chicago:

Lake Superior Charcoal	$19.25 to $19.50
Northern Coke Foundry, No. 1	19.25 to 19.50
Northern Coke Foundry, No. 2	18.75 to 19.00
Northern Coke Foundry, No. 3	18.25 to 18.50
Northern Scotch, No. 1	19.25 to 19.50
Ohio Strong Softeners, No. 1	19.05 to 19.30
Ohio Strong Softeners, No. 2	18.55 to 18.90
Southern Coke, No. 1	17.90 to 18.40
Southern Coke, No. 2	17.40 to 17.90
Southern Coke, No. 3	16.90 to 17.40
Southern Coke, No. 4	16.40 to 16.90
Southern Coke, No. 1 Soft	17.90 to 18.40
Southern Coke, No. 2 Soft	17.40 to 17.90
Southern Gray Forge	16.15
Southern Mottled	15.65
Malleable Bessemer	18.75 to 19.00
Standard Bessemer	19.55 to 19.80
Jackson Co. and Kentucky Silvery, 6 %	20.30 to 20.80
Jackson Co. and Kentucky Silvery, 8 %	21.30 to 21.80
Jackson Co. and Kentucky Silvery, 10 %	22.30 to 22.80

Metals.—The market is quiet, and prices, with the exception of Spelter, remain practically unchanged. Consumers are largely covered and no buying of consequence is expected before the middle of August or September. We quote: Casting Copper, 18¾c. to 18⅞c.; Lake, 18⅞c. to 19¼c., in car lots; small lots, ¼c. to ⅜c. higher; Pig Tin, car lots, 39½c. to 40c.; small lots, 40½c. to 41c.; Spelter, prompt delivery, 6.20c. to 6.30c., for car lots; Lead, Desilverized, 5.90c. to 6c., for 50-ton lots; Corroding, 6.57½c. to 6.67½c., for 50-ton lots: on car lots, 2¼c. per 100 lb. higher; Cookson's Antimony, 28c., and other grades, 26c. to 27c.; Sheet Zinc is $7.75 list, f.o.b. Laselle, in car lots of 60-lb. cask. On Old Metals we quote: Copper Wire, 16¾c.; Heavy Copper, 16¼c.; Copper Bottoms, 15½c.; Copper Clips, 15¾c.; Red Brass, 15½c.; Red Brass Borings, 13¾c.; Yellow Brass, 12¼c.; Yellow Brass Borings, 10¼c.; Light Brass, 8¾c.; Lead Pipe, 5½c.; Tea Lead, 5c.; Zinc, 5c.; Pewter, No. 1, 24c.; Tin Foil, 32c.; Block Tin Pipe, 27½c.

(By Mail.)

Billets and Rods.—Increased demand for Finished Material is gradually resulting in the withdrawal of large Steel makers from the open market and the Steel shortage is growing more acute daily. The Republic Iron & Steel Company is out of the market on Sheet Bars, and the American Steel & Wire Company is experiencing difficulty in securing a sufficient tonnage of Rods for its mills. The Illinois Steel Company is offering only a limited tonnage of Forging and Axle Billets and has no Rolling Billets for sale. We quote Bessemer and Open Hearth Rods at $36 to $37, f.o.b. Chicago; Forging Billets, $35 to $36, and Axle Billets, $30 in large lots.

Rails and Track Supplies.—Western roads are now contracting heavily for their requirements of Track Supplies for next year's delivery, one system having purchased 60,000 kegs of Spikes, aggregating 6000 tons. This is one of the largest individual orders for this material ever placed, although other inquiries that have come out during the week specify large tonnages of Bolts, Spikes and Splice Bars. Spikes for prompt delivery are commanding a premium, and are quoted at 2.35c. to 2.45c., Chicago. New tonnage in Standard Section Rails has been light, but the Carnegie Steel Company has booked 2000 tons for fall shipment, while another road is inquiring for 5000 tons for 1907. Quotations are without change, as follows: Angle Bars, accompanying Rail orders, 1906 delivery, 1.50c.; carload lots, 1.75c.; Spikes, 2.25c. to 2.35c.; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 15c. to 20c. above mill prices. Light Rails, 30 to 45 lb. sections, $28 to $29; 25-lb., $30; 20-lb., $30 to $31; 16-lb., $31 to $32; 12-lb., $32 to $33, and lighter sections down to 8-lb., $38 to $40, f.o.b. mill. Standard Sections, $28, f.o.b. mill, full freight to destination.

Structural Material.—During the week the Pennsylvania Steel Company booked an order for 450 tons of bridge work with a Western road, while the American Bridge Company's miscellaneous bookings, aggregating 1800 tons, were placed as follows: Chicago & Northwestern Railway, 450 tons; Copper Range Railroad, 300 tons; Indiana Steel Company, Gary, Ind., brick shed and skull cracker supports, 525 tons; Chicago Junction Railroad, 450 tons, and 200 tons for the new capitol buildin gat Boise, Idaho. Proposals for a new building for Sears, Roebuck & Co., requiring 950 tons, are under consideration. The contracts for the material required in the lowering of Chicago surface road tunnels have not yet been let. Quotations are unchanged, as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c. in addition to the usual extras for cutting to extra lengths, punching, coping, bending or other shopwork.

Plates.—Heavy specifications from shipbuilders, boiler makers and structural fitters have greatly strengthened the Sheared Plate situation, and Eastern mills, owing to the large tonnage recently booked in their immediate territory, are not seeking Western business as eagerly as they did several months ago. Shipments of certain sizes are now deferred 60 days, and on extra wide Plates as much as 90 days are required. Universal Plates are being offered in this market by one Eastern mill at a concession of $1 a ton, but as its available tonnage is small the market has not been unsettled. Another boat was placed with lake shipbuilders last week, the Steel for which will be let in a few days. Quotations are without change, as follows: Tank Plates, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 in., 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Flange quality, in widths up to 100 in., 1.86½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2c. to 2.10c.; from 72 to 96 in. wide, 2.10c. to 2.20c.; 3-16 in. up to 60 in. wide, 2.10c. to 2.20c.; 72 in. wide, 2.35c. to 2.45c.; No. 8, up to 60 in. wide, 2.15c. to 2.25c.; Flange and Head quality, 0.25c. extra.

Bars.—Steel Bar specifications, as a result of the resumption of Western implement plants, are again in excess of production and mill shipments are being further deferred. On account of their inability to secure Steel some consumers are purchasing Iron Bars, on which fairly prompt deliveries can be made, and the indications are that a large tonnage will be diverted in this way during the fall months. Transactions in Iron are of fair volume, and the numerous orders for immediate shipment that are being received by the mills are indicative of small stocks in the hands of consumers. Quotations are firm and unchanged, as follows: Iron Bars, 1.66½c.; Steel Bars, 1.66½c., both half extras; Hoops, 2.06½c., extras as per Hoop card; Bands, 1.66½c., as per Steel card; Soft Steel Angles and Shapes, 1.66½c., half extras. Store prices are as follows: Bar Iron, 2.10c.; Steel Bars, 1.85c., and as high as 2c. is asked on certain scarce sizes; Steel Bands, 1.85c. to 1.90c., half extras; Soft Steel Hoops, 2.30c. to 2.40c., full extras.

Sheets.—While there has been some falling off in new tonnage, specifications exceed shipments, and mill shipments continue to be further deferred. This week the Republic Iron & Steel Company announced its withdrawal from the Sheet Bar market and independent manufacturers are finding it increasingly difficult to secure Steel. Store shipments continue to grow in volume and premiums prevail on lots of assorted sizes. We make the following quotations: Blue Annealed, No. 10, 1.91½c.; No. 12, 1.96½c.; No. 14, 2.01½c.; No. 16, 2.11½c.; Box Annealed, Nos. 17 to 21, 2.41½c.; Nos. 22 to 24, 2.46½c.; Nos. 25 and 26, 2.51½c.; No. 27, 2.56½c.; No. 28, 2.66½c.; No. 29, 2.81½c.; No. 30, 2.91½c. Galvanized Sheets, Nos. 10 to 14, 2.61½c.; Nos. 15 and 16, 2.81½c.; Nos. 17 to 21, 2.96½c.; Nos. 22 to 24, 3.11½c.; Nos. 25 and 26, 3.31½c.; No. 27, 3.51½c.; No. 28, 3.71½c.; No. 30, 4.21½c. Sheets from store: Blue Annealed, No. 12, 2.15c. to 2.25c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.30c. to 2.40c.; Box Annealed, Nos. 18 to 20, 2.60c. to 2.70c.; Nos. 22 to 24, 2.65c. to 2.75c.; No. 26, 2.70c. to 2.80c.; No. 28, 2.85c. to 2.95c.; No. 30, 3.25c. to 3.35c. Galvanized from store: Nos. 10 to 20, 3.10c. to 3.20c.; Nos. 22 to 24, 3.35c. to 3.45c.; No. 26, 3.45c. to 3.55c.; No. 27, 3.55c. to 3.75c.; No. 28, 3.85c. to 3.95c.; No. 30, 4.45c to 4.55c.

Merchant Pipe.—Western jobbers are still buying freely, but notwithstanding the low basis that continues to prevail are limiting their purchases to 30 and 60 day requirements. There is no indication of an early advance in prices, which are lower than at any time in the history of the Pipe trade, considering the cost of Iron and Steel Skelp, and inde-

pendent mills not controlling their raw material can only produce the smaller sizes at a loss. Sales continue to be made on the basis of 81 and 5 off the list, Pittsburgh, and discounts in car lots, Chicago, are as follows: Black Steel Pipe, 79.35 per cent. on the base sizes, ¾ to 6 in., and Galvanized, 69.35 per cent. Iron Pipe is quoted from 1½ to 2 points higher. From store in small lots Chicago jobbers are quoting 76½ to 77 per cent. on Black Steel Pipe, ¾ to 6 in.

Boiler Tubes.—Specifications continue satisfactory, owing to the activity of Western boiler shops. New business, however, is light and some irregularity in store prices exists. Mill quotations are well maintained, as follows, on base sizes, 2¾ to 5 in., in car lots: Steel Tubes, 68.35; Iron, 55.35; Seamless, 50.35; 2½-in. and smaller and lengths over 18 ft., and 2½-in. and lengths over 22 ft., 10 per cent. extra. Store prices are unchanged, as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	40	35	42½
1¾ to 2¼ in.	50	35	35
2½ in.	52½	35	30
2¾ to 5 in.	60	47½	42½
6 in. and larger	50	35	..

Merchant Steel.—Concessions on desirable lots of shafting continue to be made by some manufacturers, although the leading interests, according to reports, are maintaining official prices. Nearly all of the mills producing special Shapes have their output sold through the year, and little new business is being offered. Quotations are unchanged, as follows: Planished or Smooth Finished Tire Steel, 1.86½c.; Iron Finish, up to 1½ x ½ in., 1.81½c.; Iron Finish, 1½ x ½ in. and larger, 1.66½c., base; Channels for solid rubber Tires, ¾ to 1 in., 2.16½c., and 1½-in. and larger, 2.06½c.; Smooth Finished Machinery Steel, 1.91½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.96½c.; Cutter Shoe, 2.35c.; Toe Calk Steel, 2.21½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c., and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, in base territory.

Cast Iron Pipe.—The current demand for the smaller sizes is heavy, and none of the makers is in position to make deliveries in less than 60 days. The railroads are specifying freely for small lots to be used in extensions, which are being made to nearly all of the shops throughout the West. Prices are firm and unchanged, as follows: Water Pipe, 4-in., $32.50; 6, 8, 10 and 12 in., $31.50; over 12-in., $30.50, with $1 extra for Gas Pipe.

Coke.—Notwithstanding the strikes at many of the Western foundries, Coke consumption shows no decline, and contracts are being freely made, running through the remainder of the year. Prices are practically without change, 72-hour Connellsville being quoted at $2.75 to $2.85, at the ovens, and By-Product at $5.50 to $5.65, f.o.b. Chicago.

Old Material.—Believing that the market will soon strengthen in sympathy with Pig Iron, local dealers have reduced their offerings, and are holding stocks for higher prices. The shortage of Steel making grades of Pig Iron will soon result in a heavy demand for Steel stock, and the advances on Foundry Pig Iron will make it profitable to the consumer to increase the percentage of Scrap. While most of the local Iron mills purchased heavily during the past two months, several are known to be short and are now seeking to cover. Transactions to cover short sales are numerous, and advances of 25c. a ton over prevailing quotations are frequently paid on purchases for immediate shipment. The Baltimore & Ohio Railroad is now offering 6000 tons for disposal this week, a large percentage of which is heavy Steel, and the prices that will obtain will more nearly reflect actual conditions than on any railroad list recently issued. Quotations on gross tons, car lots, f.o.b. Chicago, are as follows:

Old Iron Rails	$21.25 to $21.50
Old Steel Rails, 4 ft. and over	15.50 to 16.00
Old Steel Rails, less than 4 ft.	14.00 to 14.50
Heavy Relaying Rails, subject to inspection, 50 lbs. and under	27.00 to 27.50
Old Car Wheels	18.00 to 18.50
Heavy Melting Steel Scrap	13.00 to 13.50
Frogs, Switches and Guards	13.50 to 14.00
Mixed Steel	11.00 to 11.50

The following quotations are per net ton:

Iron Fish Plates	$16.00 to $16.50
Iron Car Axles	22.00 to 22.50
Steel Car Axles	18.00 to 18.50
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Railway Springs	13.00 to 13.50
Locomotive Tires, smooth	14.00 to 14.50
No. 1 Dealers' Forge	11.00 to 11.50
Mixed Busheling	9.00 to 9.25
Iron Axle Turnings	9.00 to 9.50
Soft Steel Axle Turnings	8.75 to 9.00
Machine Shop Turnings	8.75 to 9.00
Cast Borings	7.00 to 7.25
Mixed Borings, &c.	7.00 to 7.50
No. 1 Mill	8.25 to 8.50
No. 2 Mill	7.50 to 8.00
No. 1 Boilers, cut to Sheets and Rings	9.00 to 9.50
No. 1 Cast Scrap	13.50 to 14.00
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.00 to 13.50
Agricultural Malleable	12.50 to 13.00

Philadelphia.

REAL ESTATE TRUST BUILDING, July 31, 1906.

The activity in Pig Iron noted at the beginning of last week has been continued until to-day, by which time it is estimated that at least 150,000 tons of Basic Iron have been taken. After such heavy transactions it is natural that a period of dullness should follow, as furnaces have sold almost to their limit for 1906 deliveries. Some inquiry is being made for 1907 shipments, but with the exception of sales noticed last week it is not known that much business has been actually closed. It is curious that up to this time the demand for Finished Material has not increased in proportion to the buying in Pig Iron, although the amount of business on the books is probably the heaviest on record. That the demand will improve is regarded as a certainty, as most of the buying of Pig Iron is to cover requirements of the Steel mills during the remainder of the year. The most pleasing feature is that this immense volume of business is being handled without excitement in prices. Stability in this respect is most wholesome, as the trade well knows the annoyances and complications that arise from runaway markets. The net result of steady prices is far better than $2 or $3 up, which is invariably followed with more dollars down, and no end of kicking by those who got in on the top. There may be and should be a little advance in some of the lighter Finished Materials, but conservative people are not expecting much change from to-day's figures. Small lots and specal accommodations in the matter of deliveries may command premiums, but ordinarily the trade believes that prices will run close to those now quoted.

Pig Iron.—As already noted, business during the past week has been the heaviest on record. Buying has been of the best character, although prices show very little change. The average for the present week will probably be 25c. higher than last week, but as the keen edge of the demand has been satisfied it is hardly likely that there will be any further advance in the near future. This, however, will depend somewhat on what the furnaces can turn out. There is still a good deal of talk about furnaces going out for repairs and little in regard to others starting up, but production will probably have held its own during July, with some hope of a little increase during August. Prices will in the meanwhile be influenced by the amount of Iron available, although there is little doubt that the final outcome will be sufficient to go around without inconvenience to any one, although there seems to be a disposition in some quarters to create an impression to the contrary. Heavy buying, such as we have had during the past two or three weeks, does not necessarily mean that consumption will increase in the same proportion. It will no doubt be larger than seemed probable some time ago, but two or three weeks' buying may cover six or eight months' consumption. There is a limit to the latter, but the former may be extended almost indefinitely. Consumption is the thing that tells, although buying indicates the amount of business which consumers expect. There is more inquiry for Basic Iron to-day, and it is probable that this week's business will be very heavy. Consumers have become impressed with the idea that there is no chance for lower prices this year and have therefore covered their requirements covering that period, so as to be on the safe side. Foundry and Mill Irons have not been heavily bought thus far, although a good deal of business has been done for deliveries within 60 or 90 days. More extended deliveries will probably be called for during the month on which we have just entered and prices become definitely settled. During the past few weeks some No. 2 X Foundry could always be had at $18.25 to $18.50, but the former quotations has been dropped and not much good Iron could be had to-day at the lower figure, $18.75 being the regular asking price. Mill Irons have varied from $16 to $16.25, but half a dollar more is asked to-day, with a very fair amount of sales. A fair average for Philadelphia and nearby deliveries at this time would be about as follows:

No. 1 X Foundry	$19.00 to $19.25
No. 2 X Foundry	18.50 to 18.75
No. 2 Plain	18.00 to 18.25
Standard Gray Forge	16.50 to 16.75
Ordinary Gray Forge	16.00 to 16.25
Basic	17.85 to 18.00
Low Phosphorus	24.50 to 24.75
Malleable	18.75 to 19.00
Bessemer	19.85 to 20.00
Lake Superior Charcoal	21.00 to 22.00

Steel.—Demand is very active and prices show an upward tendency. Specially desirable orders as to date and specifications might be done at about $29 for nearby deliveries of Open Hearth Billets, but $29.50 is the usual quotation for ordinary sized lots. Forging Billets are $32.50 to $33.50.

Steel Alloys.—The market is dull but somewhat unsettled, owing to labor and other conditions in southeast Russia. Consumers are more anxious to get what they bought than to place new business, so that prices are almost nominal, at about $80 for last quarter shipments of Ferro, or $88 to $90 for Spot, with $35 to $36 asked for Spiegel.

Plates.—A strong demand is reported for Plates, orders coming in from all sources, both nearby and from a distance. Specifications are also coming in well, so that the mills are fully employed. Order books are probably better covered than they have ever been, the tonnage being the largest on record. Prices are unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel	1.73½	1.78½
Flange or Boiler Steel	1.83½	1.88½
Marine	2.13½	2.18½
Locomotive Firebox Steel	2.23½	2.28½

The above are base prices for ¼-in. and heavier. The following extras apply.

	Extra per 100 pounds.
3-16-in. thick	$0.10
Nos. 7 and 8, B. W. G.	.15
No. 9, B. W. G.	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00

Structural Material.—The demand is not materially different from what it has been for some weeks, but it is sufficient to keep the mills fully employed. No particularly notable contracts have been given out in this district, but there is enough casual trade to keep every wheel turning. Prices are unchanged, as follows: Beams, Angles and Channels, 1.83½c. to 2c., delivered.

Bars.—The demand still drags, but there is good reason to believe that there will be plenty of business in the near future. All other lines are showing marked improvement, and it is sure to strike the Bar trade before long. Prices are unchanged at 1.63½c. to 1.68½c. for either Iron or Steel Bars, but it would not take much buying to put them higher.

Sheets.—The demand is good, although prices, while firm, are quoted the same as last week (mill shipments about a tenth less), as follows: Nos. 18 to 20, 2.40c.; Nos. 22 to 24, 2.50c.; Nos. 25 and 26, 2.60c.; No. 27, 2.70c., and No. 28, 2.80c.

Old Material.—The market is again higher, and under light offerings it looks as though further advances might be scored in the near future. There is said to be a heavy short interest in Steel, and some dealers, to cover their contracts, are offering more than the mills are willing to pay. Sales have been made at $16.75 to nearby mills, but some holders ask $17 for additional lots. Bids and offers for deliveries in buyers' yards are about as follows:

Steel Crops	$16.75 to $17.00
No. 1 Steel Scrap	16.50 to 17.00
Low Phosphorus Scrap	20.00 to 21.00
Old Steel Axles	20.50 to 21.00
Old Iron Axles	27.00 to 27.50
Old Iron Rails	21.00 to 22.00
Old Car Wheels	16.50 to 17.00
Choice Scrap, R. R. No. 1 Wrought	19.00 to 19.50
Choice No. 1 Yard Scrap	17.00 to 17.50
Long and Short	15.00 to 16.00
Machinery Scrap	16.00 to 16.50
Wrought Iron Pipe	13.50 to 14.00
No. 1 Forge Fire Scrap	13.00 to 13.50
No. 2 Light Ordinary	10.00 to 11.00
Wrought Turnings	12.00 to 12.50
Axle Turnings, Choice Heavy	12.50 to 13.00
Stove Plate	11.50 to 12.00
Cast Borings	9.75 to 10.25

Frank Samuel, Harrison Building, Philadelphia, has purchased the Plymouth Rolling Mill property at Conshohocken, Pa., including the land, which has railroad connection with both the Philadelphia & Reading and the Pennsylvania railroads.

The offices of the Logan Iron & Steel Company in Philadelphia have been removed to 808 North American Building.

Birmingham.

BIRMINGHAM, ALA., July 29, 1906.

Pig Iron.—From present indications it would seem that producers have carried the day and now have control of the situation. The restricted production, together with the large tonnage sold during the past 30 days, places them in position to make pretty much their own prices on future sales. Some of the furnace companies report the sale of their entire output for the year, based on present production, while others have withdrawn from the market for the time being, not because they have no Iron to offer, but having sold enough to make them easy are content to wait for further advance. Very little increase in the production of Foundry grades can be expected for some time, as practically all the furnaces now working on Basic will continue for the balance of the year, owing to the unprecedented demand for Steel making Iron. Of the 16 furnaces of the Tennessee and Republic companies only four are making Foundry Iron, the others being out of blast for repairs or running on Basic. The Southern Steel Company at Gadsden, will complete repairs on its furnace within the next week or ten days and the Alabama Consolidated Coal & Iron Company, which has been furnishing the former with Basic Iron, will put its furnace back on Foundry grades. The Birmingham Iron Company, whose furnace at Boyles has been undergoing repairs and relining for the past 60 days, will blow it in this week. The prices quoted by those who are still taking orders are from $13.50 to $14, on a No. 2 Foundry basis, but in making these prices they display very little desire to sell.

Cast Iron Pipe.—The situation remains very much the same as for the past three or four months. All the foundries are rushed with orders, with the usual quota of inquiries for small lots still coming in. The makers of Cast Iron Soil Pipe are enjoying a very prosperous season and are without exception far behind with their orders. Labor conditions are perhaps affecting this industry more than any other in the district, as on account of the warm weather it is almost impossible to get molders to work with any regularity. Prices on Water Pipe are firm, and are about as follows, f.o.b. cars here: 4 to 6 in., $28; 8 to 12 in., $27.50; over 12 in., $26. Gas Pipe, $1 per ton extra.

Old Material.—The Scrap market, in sympathy with Pig Iron, is considerably stronger than last week. Especially is this true of Cast. Several nice sales of this grade have been reported this week, and very small stocks are now in dealers' hands. Wrought continues quiet, the dealers preferring to hold it rather than turn it loose at present prices. Quotations are about as follows per gross ton, f.o.b. cars here:

Old Iron Rails	$18.50 to $19.00
Old Iron Axles	18.00 to 18.50
Old Steel Axles	16.00 to 17.00
Old Car Wheels	16.50 to 17.00
No. 1 Railroad Wrought	15.00 to 15.50
No. 2 Railroad Wrought	14.00 to 14.50
No. 1 Country Wrought	13.00 to 13.50
No. 2 Country Wrought	11.00 to 11.50
Wrought Pipe and Flues	11.50 to 12.00
Railroad Malleable	12.00 to 12.50
No. 1 Steel	11.00 to 11.50
No. 1 Machinery Cast	11.00 to 11.50
Stove Plate and Light Cast	8.50 to 9.00

The Payne & Joubert Machine & Foundry Company will make its first castings on August 1. This company is just completing, at a cost of $150,000, one of the best equipped foundries in the South. Its specialties are to be sugar mill machinery and large furnace castings, being equipped to make castings up to 50,000 lbs.

Pittsburgh.

PARK BUILDING, August 1, 1906.—(*By Telegraph.*)

Pig Iron.—It is commencing to look like a runaway market in Pig Iron, and there is more activity at present in Bessemer, Basic and Foundry Irons than at any time for months. There is an undoubted scarcity, and furnaces have no trouble in getting higher prices for Pig Iron if they can arrange deliveries. Bessemer Iron is very strongly held at $18, Valley furnace, and we note sales of 1000 tons, 600 tons and 1500 tons to local consumers for August and September delivery at this price, or $18.85, Pittsburgh. A sale is also reported of 15,000 tons of Bessemer Iron, equal deliveries over last four months of this year, at the same price, this Iron going to a large Western consuming interest. We also note sales of 2000 tons or more of Basic Iron, for August and September delivery, at $17.50, Valley furnace. There has been some heavy buying of Foundry Iron, the largest purchaser being the Westinghouse Machine Company, which has bought 6100 tons, all from Northern furnaces and for extended delivery. Prices on this Iron range up from $16.90, Valley furnace, for No. 2, considerably higher prices having been paid for some of it. The Union Switch & Signal Company of this city is reported to have bought 5000 to 6000 tons of Foundry Iron for forward delivery, while other local consumers have been buying heavily. The total sales of Foundry Iron the past week are estimated at upward of 20,000 tons. Prices are very firm, and we quote Northern No. 2 $17.25 to $17.50, Valley furnace, some sellers refusing to shade the higher price. Forge Iron is also firm and higher, and we quote $16.50 to $16.75, Valley furnace, or $17.35 to $17.60, Pittsburgh.

Steel.—Billets and Bars are just as scarce as ever and command almost any price that sellers care to ask. We quote Bessemer Billets $27.50 to $28, and Open Hearth Billets $28 to $29, Pittsburgh. Forging Billets can hardly be had at any price. Sheet Bars in long lengths are held at $29, Pittsburgh. We note a sale of 600 tons of cut Sheet Bars at $28.50, Youngstown, or $29.45, Pittsburgh.

(*By Mail.*)

The unprecedented midsummer activity in the Iron trade continues in full swing, and the tonnage of new business in Pig Iron, Steel Billets and Finished Iron and Steel that is being placed with the mills is simply amazing, insuring full activity of the manufacturing industries up to the close of the year. It can be stated that owing to the heavy demand and the limited supply of Pig Iron the market is threatened with a famine. Consumers are having great trouble to get Pig Iron for prompt delivery. The available supply of Bessemer and Basic Pig Iron for August and September is fully taken up and a good deal of tonnage is being placed for the last quarter of the year. The minimum price of

Bessemer Iron is $18, Valley furnace, while Basic is very strong and quite scarce at $17.50. Foundry Iron has again advanced and is now firmly held at $17.25 to $17.50, Valley furnace, for No. 2. Forge Iron is also higher, sellers now quoting Northern brands at $16.50, Valley furnace, or $17.35, Pittsburgh. The scarcity in Billets, Sheet and Tin Bars shows no abatement, and they continue to command high prices. The tonnage in Finished Iron and Steel placed in July was probably the heaviest ever known for that month, not even excepting the boom year of 1902. Leading interests have enough work on their books to take practically their entire output for the balance of this year, and new business coming in is heavy. Prices all along the line are firm, and if present prices of Steel are maintained, and they give every appearance of being held, it would not be surprising if prices on some finished lines, such as Sheets, Tin Plate and Wire products, would be advanced in the early fall. The Scrap market is showing more activity than for some time and prices are firmer. Connellsville makes of Furnace and Foundry Coke are scarce, owing to the inability of the operators to get labor, and prices are higher. The whole Iron market could hardly be in a more satisfactory shape.

Ferromanganese.—We note a very active demand and can report sales of 300 tons for balance of the year shipment at $80 to $83, Pittsburgh. For August delivery it is held at $90 to $95, Pittsburgh. Indications are that prices will be higher.

Muck Bar.—Owing to the higher prices for Forge Iron there has been a sharp advance in Muck Bar, and we now quote best grades, made from all Pig Iron, at $29.50, Pittsburgh.

Wire Rods.—The scarcity in Steel Billets is reflected in Rods, which are somewhat hard to obtain for prompt delivery. We quote Bessemer and Open Hearth Rods at $34, and Chain Rods, $35, Pittsburgh.

Skelp.—A fair amount of new tonnage is being placed, and specifications on contracts are coming in freely. Prices are firm, as follows: Grooved Steel Skelp, 1.57½c. to 1.60c.; Sheared Steel Skelp, 1.60c. to 1.65c.; Grooved Iron Skelp, 1.65c. to 1.70c.; Sheared Iron Skelp, 1.75c. to 1.80c., Pittsburgh, these prices being for ordinary widths and gauges.

Structural Material.—No large contracts have been placed in this district the past week, but inquiries are plentiful and a good deal of tonnage is being entered from day to day by the Structural concerns. The new business entered in July by the American Bridge Company is said to have been the heaviest in that month in its history. Other leading Structural concerns report a similar condition. Prices are firm, but unchanged, as follows: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x ¼ in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3½ in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3-in. are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—The lake shipyards are filled up into April of next year, so many contracts for boats having been placed in the past month that 50,000 tons or more of Plates and other Shapes will be required for them. Deliveries on Sheared Plates cannot be made now in less than 30 days, while on Universal Plates the mills are from six weeks to two months behind. Prices are firm and we quote: Tank Plates, ¼ in. thick, 6¼ in. up to 100 in. in width, 1.60c., base, at mills, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edge	$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—The demand for both Black and Galvanized Sheets continues heavy, and all the mills are very much behind in deliveries. The continued scarcity and high prices of Sheet Bars may result in an early advance in prices of Sheets, and the trade is generally anticipating such action on the part of the leading interest. Prices are very firm, as follows: Nos. 17 to 21, 2.25c.; Nos. 22 to 24, 2.30c.; Nos. 25 and 26, 2.35c.; No. 27, 2.40c.; No. 28, 2.50c.; No. 29, 2.65c., and No. 30, 2.75c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.45c.; Nos. 12 and 14, 2.55c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.80c.; Nos. 22 and 24, 2.95c.; Nos. 25 and 26, 3.15c.; No. 27, 3.35c.; No. 28, 3.55c.; No. 29, 3.80c., and No. 30, 4.05c. We quote No. 28 Gauge Painted Roofing Sheets at $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $3.10 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances for small lots from store.

Bars.—New business in Iron and Steel Bars placed in July was unusually heavy, and on Steel Bars the mills are from six weeks to three months behind in deliveries. No heavy contracts for Iron Bars are being placed, but current orders are fairly large, and the mills have a comfortable tonnage ahead of them. Prices are firm, and we continue to quote Iron and Steel Bars at 1.50c., base, half extras for carloads and larger lots.

Hoops and Bands.—Specifications on contracts are coming in freely and give the mills a full amount of work. We quote Steel Hoops at 1.90c. and Bands for all purposes at 1.50c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of $2 a ton being charged for less than carloads.

Tin Plate.—This is the off season in the Tin Plate trade, but it is expected that by September 15 a heavy demand will set in, as large contracts are usually placed by the canning interests and other consumers about that time. The mills are still having trouble in getting Tin Bars, and the Pope Tin Plate Company at Steubenville is shut down and will be idle for a week or two until sufficient bars have been accumulated to warrant starting up. Other Tin Plate mills are also running light for lack of Bars. We quote Tin Plate at $3.75 per base box, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days, less 2 per cent. off for cash in 10 days, on which prices a rebate of 5c. a box is allowed for carloads and larger lots.

Railroad Spikes.—The demand continues unusually active, and mills are filled for the next two or three months. We quote Railroad Spikes at $2.20 to $2.25 per 100 lbs., f.o.b. Pittsburgh.

Merchant Steel.—Specifications on contracts for agricultural Steels continue heavy, and the mills are from two to three months behind in deliveries. Official prices on Shafting are continued, but in some cases they are being shaded on desirable orders. We quote: Planished or Smooth Finished Tire Steel, 1.70c.; Iron Finished, up to 1½ x ½ in., 1.65c., and Iron Finish, 1½ x ½ in. and larger, 1.50c., base, Pittsburgh, and Channels for solid rubber tire are quoted as follows: ¾, ⅞ and 1 in., 2c., and 1⅛-in. and larger, 1.90c.; Toe Calk Steel, 2c. to 2.05c.; Railway Spring Steel, 1.75c. to 1.80c.; Cutter Shoes, 2.20c. to 2.25c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Crucible Tool Steel, 6c. to 8c. for ordinary grades and 12c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. discount in carloads and 45 per cent. in less than carloads, delivered in base territory.

Spelter.—The demand is rather quiet and prime grades of Western are held at about 5.85c., St. Louis, equal to 5.97½c., Pittsburgh.

Merchant Pipe.—The National Tube Company has taken a large order for 12-in. Line Pipe from the Carnegie Natural Gas Company. No other large Pipe Lines have been closed, but a good deal of tonnage is under negotiation, and some large contracts are expected to be placed within the next week or two. The demand for Merchant sizes of Pipe is heavy, and the leading mills are filled for the next two or three months. It would seem that conditions in this trade would warrant higher prices, but there are no indications of an advance in the near future. The extreme discount on Merchant sizes of Steel Pipe remains at 81 and 5 per cent. off, to the large trade. Official discounts for carloads, which continue to be shaded one point or more, are as follows:

Merchant Pipe.

	Jobbers, carloads.			
	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
	%	%	%	%
⅛ and ¼ in.	72	56	69	53
⅜ in.	74	60	71	57
½ in.	76	64	73	61
¾ to 6 in.	80	70	77½	67½
7 to 12 in.	75	60	72½	57
Extra strong, plain ends:				
⅛ to ⅜ in.	65	53	62	50
½ to 4 in.	72	60	69	57
4½ to 8 in.	68	56	65	53
Double extra strong, plain ends:				
½ to 8 in.	61	50	58	47

Boiler Tubes.—We note a fair demand for Locomotive and Merchant Tubes, but the tonnage being placed with the mills is not as heavy as some time ago. There is some unevenness in prices, which are being shaded more or less on desirable orders. Official discounts for carloads are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ in.	45	50
1⅝ to 2¼ in.	45	62
2½ in.	50	64
2¾ to 3 in.	57	70
6 to 13 in.	45	62

Iron and Steel Scrap.—The higher prices and scarcity of Steel making Pig Irons are reflected in Steel Scrap, which is in distinctly better demand and prices are higher. Heavy Steel Scrap is now held at $16.50, minimum, while some dealers are asking $17. Other grades of Scrap are firmer, dealers quoting about as follows: Bundled Sheet Scrap, $13.75 to $14; No. 1 Wrought Scrap, $17.25 to $17.50; Machinery Cast Scrap, $15.50; Cast Iron Borings, $8.25 to $8.50; Old Steel Rails, short pieces, $15.50 to $15.75; Old Steel Rails, rerollers, $17.25 to $17.50; Axle Turnings, $12.50; Stove Plate, $10.25 to $10.50; Wrought Turnings, $11.50 to $11.75—all in gross tons, f.o.b. Pittsburgh.

Coke.—The greatest scarcity in labor ever known now exists in the Connellsville region and Coke operators find it utterly impossible to get sufficient men to operate their ovens full time, with the result that the output of Coke is greatly decreased, both Furnace and Foundry being scarce and bringing high prices. We quote strictly Connellsville Furnace Coke at $2.75 and 72-hr. Foundry at $3 a ton, at oven. The output of Coke in the Upper and Lower Connellsville regions last week showed a material falling off over the previous week.

Louis Steinfirst has withdrawn as a partner from the Keystone Iron & Metal Company, McKee's Rocks, Pittsburgh, and the business will be continued by Charles Neidhart, Jr., under his own name.

Cleveland.

CLEVELAND, OHIO, July 31, 1906.

Iron Ore.—The furnaces in this territory have started another extensive buying movement. The demand is exceptionally strong for high grade Ores, but there is hardly likely to be any shortage. The fact is to be taken into consideration that some of the Ore piles along the lakes have not been disturbed for years. Some consumers, fearing a shortage in this year's movement, are disposed to bid up for what they want, resulting in quotations of $4.50 to $4.75 at Lake Erie ports. The shipments of lower grade Ores are heavier than was anticipated, and it is likely that this immense movement will bring the year's total above that of a year ago. The delays noted early in the month in unloading boats at the various Lake Erie ports have been relieved by a better supply of cars in the lake trade. The present expectation is that the Ore movement for the month will be at least 5,700,000 tons, establishing a new record for the lakes. It is apparent this is not up to the capacity of lake tonnage, and consequently shows certain inability on the part of the mines to forward as much Ore as was hoped for.

Pig Iron.—A sudden buying movement in Foundry Iron appeared in the week. This was coupled with a heavy demand from the furnaces to anticipate shipments on contract. The result has been a strengthening of the market at an unusual time of the year. One or two of the most conservative furnace interests have violated an established practice by advising customers to place their orders now. Others are cautioning buyers against attempts to cover when there is no immediate need, and thus prevent competitive buying that will hasten the natural tendency toward higher prices. The Toledo furnace of Pickands, Mather & Co. resumed operations on July 18, and the idle Cherry Valley Furnace has been running for 10 days. These have not helped the situation, since they are already sold up for the remainder of this year. But one concern here has Iron to sell for August delivery. The remainder of the needs must be supplied from the East, southern Ohio or from the Birmingham district. The buying in that quarter has been exceptionally strong. One Cleveland furnace announces that it has closed contracts in the past week for 15,000 tons of Iron, the largest lot being 1500 tons. Part of this was for first quarter delivery in 1907. Some other interests are also selling at $17 in the Valleys for the same delivery. Spot shipment material is almost out of the question. One sale was made last week at $18.15, delivered, and the same interest is now holding at $18.45, delivered. The minimum is $17 in the Valleys, apparently with higher prices immediately ahead. Southern producers are selling No. 2 in this territory at $14, Birmingham. Basic and Bessemer Irons are also very strong, with Bessemer selling for spot shipment at $17.75. Lower priced Iron is out of the question. Basic is strong at $17.25 in the Valleys. The market is exceptionally strong all through, with Pig Iron scarce.

Coke.—The market is much stronger and Coke is scarce. The best grades of 72-hour Foundry are now selling at $3 as a minimum, while Furnace Coke is selling at $2.60 at the oven.

Finished Iron and Steel.—The Acme Steamship Company gave a contract last week to the American Shipbuilding Company for another new steamer for 1907 delivery. This company is closely allied to interests behind the shipbuilding company. The Steel, it is understood, has been placed with the big Pittsburgh mills. The sales of Steel for ships really amount to specifications against standing contracts for the lake business. The demand for Structural Shapes and Plates is as strong as ever, with especially good specifications against existing contracts. The Bar Iron market at present is strong. While the price holds nominally at 1.50c., Pittsburgh, many mills are sold up and others announce they will not sell below 1.60c., Pittsburgh. Sheets are active at former prices. Quotations out of stock are: No. 10 Blue Annealed, 2.15c.; No. 28 One Pass Cold Rolled, 2.85c.; No. 28 Galvanized, 3.85c. Forging Billets are strong at $34 to $35, delivered in Cleveland, and Bessemer Billets are $28 to $30, delivered. Steel Bars are strong at the old prices, specifications being heavy. The market holds at 1.50c., Pittsburgh, for Bessemer and Open Hearth.

Old Material.—The Scrap market is steady. Some mills are beginning to buy a little. The following represent dealers' prices to the trade, f.o.b. Cleveland, gross tons: Old Steel Rails, $15; Old Iron Rails (nominal), $21 to $22; Iron Car Axles (nominal), $18.50 to $19.50; Heavy Melting Steel, $15. Net tons: Cast Borings, $8; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $15.50 to $16; No. 1 Cast, $14.50; Iron and Steel Turnings and Drillings, $9.50 to $10.50.

Cincinnati.

FIFTH AND MAIN STS., August 1, 1906.—(*By Telegraph.*)

Pig Iron.—The past week has added further strength to the market. Inquiry is enlarging decidedly, and requirements for the first quarter of 1907 are being considered. The sold up condition of furnaces in our territory, both North and South, has become an important factor in the situation, and the tendency is toward higher prices as a result of the restricted output. It is the opinion of the well informed that the Southern producers, with possibly one or two exceptions, have almost their full output of Iron contracted for during the remainder of the year, at least so far as the Foundry grades are concerned. The same may be said regarding the furnaces in the North, reports indicating that with scarcely an exception they have very limited tonnage to offer for the balance of the year. Possibly the most distinctive feature of the week has been the large increase in inquiries for deliveries after the first of the year, not perhaps in the way of any heavy tonnage, but along the line of medium requirements. The demand for Malleable Bessemer continues strong. Reports indicate that the furnaces in all parts of the country are greatly hampered by labor scarcity. Southern No. 2 is to-day quotable at $13.50 to $14, Birmingham, with perhaps most of the sales made at $13.75. The trend is unmistakably upward, and it is reasonably safe to predict that quotations below $14 will have disappeared altogether within the next few days. Northern No. 2 is strong and well established at $17, Hanging Rock basis. Local trade within this territory has been exceptionally active during the week. An inquiry is pending from one of the large railroads for about 1500 tons of No. 1 Southern for August and September delivery; another from a Michigan buyer for 6000 tons, divided between Northern and Southern, delivery running into the first half of next year; also one for 3000 tons for the same period from an Indiana melter. Freight rates from the Hanging Rock district are $1.15, and from Birmingham, $3. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$17.00 to $17.50
Southern Coke, No. 2	16.50 to 17.00
Southern Coke, No. 3	16.00 to 16.50
Southern Coke, No. 4	15.50 to 16.00
Southern Coke, No. 1 Soft	17.00 to 17.50
Southern Coke, No. 2 Soft	16.50 to 17.00
Southern Coke, Gray Forge	14.75 to 15.25
Southern Coke, Mottled	14.50 to 14.75
Ohio Silvery, No. 1 (8 per cent. Silicon)	21.65 to 22.15
Lake Superior Coke, No. 1	18.65
Lake Superior Coke, No. 2	18.15
Lake Superior Coke, No. 3	17.65

Car Wheel Irons.

Standard Southern Car Wheel	$24.00 to $24.25
Lake Superior Car Wheel	22.50 to 22.75

Coke.—Reports indicate that the labor situation is causing some uneasiness, the shortage of workmen greatly restricting the output. Prices are decidedly strong, with considerable business being contracted for as far ahead as July next year. We quote best brands of Connellsville and Virginia Foundry $2.90 to $3.10, f.o.b. ovens.

Finished Iron and Steel.—Trade continues to grow and the situation is improving. The Structural demand is good, and prices are firm. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.63c., with half extras; the same, in smaller lots, 2c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same, in small lots, 1.85c., with full extras; Base Angles, 1.83c., in carload lots; Beams and Channels, in carload lots, 1.83c.; Plates, ¼-in. and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16 gauge, in carload lots, 2.15c.; in

smaller lots, 2.70c.; 14 gauge, in carload lots, 2.05c.; in small lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.83c. in carload lots.

Old Material.—There is little change to be noted, but perhaps a shade better tone is evident. Trade with rolling mills is said to be slightly more active. We quote dealers' prices, f.o.b. Cincinnati, about as follows: No. 1 Railroad Wrought Scrap, $14 to $14.50 per net ton; Cast Borings, $5 to $6 per net ton; Steel Turnings, $7 to $8 per net ton; No. 1 Cast Scrap, $12 to $13 per net ton; Iron Rails, $19 to $20 per gross ton; Steel Rails, rolling mill lengths, $14 to $15 per gross ton; Relaying Rails, 56-lb. and upward, $28 to $29 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $17 to $18 per gross ton; Low Phosphorus Scrap, $18 to $19 per gross ton.

New York.

NEW YORK, August 1, 1906.

Pig Iron.—Heavy buying of Basic Iron for deliveries running through the remainder of the year has been in progress in the past week, and it is estimated that upward of 125,000 tons has been taken within two weeks. The leading consumers in the East are now covered, with one or two exceptions, up to January 1. Considerable Iron was taken also for early delivery, indicating that buying was postponed to the last hour. Prices maintained a surprising evenness for so large a volume of business. At the beginning of the movement the basis was $17.50, delivered, on contracts running through the last quarter, while spot Iron was about 25c. higher. Toward the last of the buying an f.o.b. furnace basis became the rule, sellers quoting $17, and in some cases a little higher, with freights ranging from 75c. to $1.15. The Foundry Iron trade has shown no special increase of interest, but there is steady buying in moderate lots. Buffalo Irons are now quoted 50c. higher, making the New England price $20 for No. 2, or an advance of $1.50 in the past month. These Irons were below the general Eastern market at the opening of July. Some eastern Pennsylvania furnaces are now asking $18 at furnace for No. 2, but this figure has not been established. Some little business in Forge Iron is reported with eastern Pennsylvania mills at $16 to $16.50, delivered. We quote Northern Pig Iron, No. 1, at $18.75 to $19.25, No. 2 at $18.25 to $18.50, and No. 2 Plain at $17.50 to $17.75, tidewater. Southern Iron ranges from $18.25 to $18.75 for No. 1, and from $17.50 to $17.75 for No. 2, with a $4 freight from Birmingham.

Steel Rails.—Actual bookings in the week have been comparatively light. The chief contract for 1907 is 6000 tons for the Buffalo, Lockport & Rochester. Miscellaneous orders, including trolley road purchases, amount to 6000 tons for 1906. The report of an addition of 35,000 tons to the Pennsylvania Railroad contracts for 1907 is erroneous, the 180,000 tons originally announced covering all business thus far placed by this company for next year.

Structural Material.—The American Bridge Company's bookings in July reached a total of 45,000 tons, as against a monthly average of 57,000 tons for the first six months of the year. The Rail mill at Gary, which was expected as a July contract, has not yet come upon the company's books. It will require 16,000 to 18,000 tons of Steel. The new Manhattan Bridge, the contract for which was taken a few months ago by the Ryan-Parker Construction Company, New York, is of immediate interest to Steel manufacturers, as it is expected the Open Hearth Steel will soon be placed with a Central Western mill. The surmise that the successful bidder expected to turn the contract over to an Eastern Steel and fabricating interest proves to have been erroneous. In the past week the American Bridge Company has booked 2000 tons of elevated crossing work for the Grand Trunk at Chicago. The New York Central has placed with the same company 700 tons of bridge work, the Copper Range Railroad 300 tons and the Michigan Central 750 tons. Export work recently taken includes a five-story hotel in Havana, which will be erected by Milliken Brothers. The amount of work ahead that has not yet been formally contracted for is large, and in New York City some good business is expected to be announced in the near future. Quotations on mill shipments, tidewater delivery, are as follows: Beams, Channels, Angles and Zees, 1.84½c.; Tees, 1.89½c.; Bulb Angles and Deck Beams, 1.99½c. On Beams 18 to 24 in. the extra is 0.10c., and on Angles over 6 in., 0.10c. Beams and Channels out of stock are sold at 2½c.

Bars.—An excellent demand is experienced for both Iron and Steel Bars, with prices firmly held to the official basis of 1.50c., Pittsburgh. The Eastern Iron rolling mills are still turning out much less than their usual production, as quite a number of them are closed by the strike of their operatives. Efforts are being made in some instances to break the strike and start the mills. Mill shipments, tidewater, are quoted at 1.64½c. for Steel Bars or Best Refined Iron Bars.

Plates.—The local market continues stagnant. While a good deal of fabricated Plate work is going into improvements in this city and vicinity, it is being completed in outside shops, where wages and hours are more in favor of employers. The Eastern Plate mills are so well filled with business from other sections that prices are firmly held. Quotations for tidewater delivery are as follows: Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine Plates, 2.14½c. to 2.24½c.; Fire Box Plates, 2.24½c. to 2.60c., according to specifications.

Cast Iron Pipe.—Manufacturers are now much more occupied in trying to satisfy the demands for urgent delivery from those with whom they have contracts than in the effort to get new business. Inquiries continue, but they are steadily being passed unless buyers are willing to have deliveries deferred for three or four months. Carload lots of 6-in. are nominally quoted at $31 to $32.

Old Material.—A phenomenal condition in the Scrap trade is the fact that Cast Scrap is bringing considerably higher prices than Heavy Melting Steel Scrap. This has seldom occurred. It indicates very strongly the scarcity of Foundry Pig Iron. The demand for Cast Scrap continues quite active, and undoubtedly more business would be done if the stock controlled by dealers was larger. The supply, however, is decidedly restricted. A considerably improved demand is noted for Wrought Scrap. Consumers of Steel Scrap have made offers slightly under the current market for large blocks during the week, which have been refused by local dealers. The market for Old Material is steadily growing stronger, and buying is becoming more general. Quotations for New York and vicinity are approximately as follows:

Old Iron Rails	$20.50 to $21.00
Relaying Rails	26.00 to 26.50
Old Steel Rails, rerolling lengths	16.00 to 16.50
Old Steel Rails, short pieces	15.00 to 16.00
Heavy Melting Steel Scrap	15.00 to 16.00
Standard Hammered Iron Car Axles	25.00 to 26.00
Old Steel Car Axles	19.50 to 20.00
No. 1 Railroad Wrought	18.00 to 18.50
Iron Track Scrap	16.00 to 16.50
No. 1 Yard Wrought, long	16.50 to 17.00
No. 1 Yard Wrought, short	15.00 to 15.50
Wrought Pipe	12.50 to 13.00
Light Iron	9.50 to 10.00
Cast Borings	9.00 to 10.00
Wrought Turnings	11.25 to 11.75
Old Car Wheels	16.50 to 17.50
No. 1 Machinery Cast	15.75 to 16.25
Stove Plate	11.00 to 12.00
Grate Bars	10.00 to 10.50
Malleable Cast	15.50 to 16.00

Metal Market.

NEW YORK, August 1, 1906.

Pig Tin.—The statistics issued to-day, as compiled by C. Mayer, secretary of the New York Metal Exchange, were favorable to consumers. The July deliveries into consumption, 3100 tons, probably represent more metal than was sold during the month, as some of the high priced Tin was shipped to the interior. The stocks in this country at the end of July were 1495 tons, an increase of 283 tons as compared with the previous month. The total visible supply was 12,184 tons, an increase of 228 tons against June 30, 1906, and a decrease of 86 tons compared with July 31, 1905, when the price was 4c. per lb. lower. The shipments from the Straits show an increase of 655 tons for the first seven months of this year, and it is hinted that Chinese operators in the East have been holding back shipments. The market during the week has been very dull, the price being around 37.25c., except on Thursday, when 26.95c. was asked. On Tuesday of this week there was an inquiry in the market for about 100 tons. To-day's price is a little higher at 37.40c., due to a slight advance in London, which closes at £171 2s. 6d. for spot and £171 7s. 6d. for futures.

Copper.—The market is unchanged from last week. Most brands of Lake can be had at 18.50c. to 18.75c., although a special make is held at 18.87½c. There are a few outside lots of Electrolytic said to be held at 18.25c. to 18.50c., but the larger producers are asking 18.50c., delivered 30 days. Sales are being made in Europe at 18.70c., c.i.f., but the London Exchange quotes £82 2s. 6d. for spot, £81 10s. for futures. Best Selected brands are held at £87. Cask lots of Lake can be had at 18.75c. to 19c.; for Electrolytic, 18.75c. to 18.87½c. is asked. There has been some fair sales for delivery in Europe, but domestic business has been light. Consumers, however, are well covered for present needs. The exports for July were good, amounting to 17,509 tons, exclusive of Southern ports. The total exports for the first seven months were 119,274 tons, a decrease of 29,005 tons as compared with the same period in 1905. Domestic consumption during the first half of last year, however, was smaller than the first half of this year.

Lead.—The holders of foreign Lead, who have been asking 5.75c. or thereabouts for some time, seem disposed to liquidate, and there is some talk of their peddling it out in ton lots. While it is barely possible to import Lead now at 5.75c., still there is little or no profit in it. Domestic Lead can probably not be obtained under 5.77½c., but sales have been made around this price. The St. Louis market is quoted at 5.65c. The American Smelting & Refining Com-

pany continues to quote shipment Lead in 50-ton lots at 5.75c. Sales are being made only at price ruling on date of shipment, the above price governing existing contracts. The London market is easier at £16 12s. 6d.

Spelter.—There is a firmer tone to the market, 5.95c., St. Louis, having been freely bid and declined. Makers are holding later deliveries for higher prices. In New York prime Western can be had at 6.12½c., but spot business is dull.

Antimony.—There is considerable speculation as to the true state of affairs in the Antimony market. London prices have declined and £102 is quoted. The importers appear to be letting speculative holders do the selling, and the metal can be had within the following range: Cookson's, 24.50c. to 25.50c.; Hallett's, 23.50c. to 24.50c.; other brands, 23c. to 23.50c. Some who are well posted about trade conditions express the belief that prices will go lower, while other well informed sellers believe that the scarcity of Ore will preclude any lower prices at present.

Aluminum.—The price is unchanged, No. 1 Ingots being held at 36c., and No. 2 Ingots at 34c. per lb. The demand is excellent, and the producer is making some headway in the matter of shipments.

Quicksilver.—Prices are steady and unchanged. Flasks of 75 lbs. in lots of 100 flasks, are quoted at $41 per flask. Small lots can be had at $41.50 to $42.

Nickel.—Large consumers are quoting 45c. to 50c. Nickel in small quantities can be obtained at 55c. to 65c.

Tin Plate.—Trade in Bright Plates is good, considering the season of the year, but Terne Plate buying is only fair. The mills are delivering Bright Plates about 14 weeks after specifications are received, and Terne Plates in eight weeks. The price is unchanged at $3.94, f.o.b. New York, and $3.75, f.o.b. Pittsburgh, subject to the usual trade discount.

Old Metals.—There is little or no change in the market, and dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	17.75 to 17.87½
Copper, Heavy and Wire	17.50 to 17.75
Copper, Light and Bottoms	15.75 to 16.00
Brass, Heavy	12.00 to 12.25
Brass, Light	9.75 to 10.00
Heavy Machinery Composition	15.75 to 16.00
Clean Brass Turnings	11.00 to 11.25
Composition Turnings	13.50 to 13.75
Aluminum Scrap	26.00 to 28.00
Lead, Heavy	5.20 to 5.35
Tea Lead	5.00 to 5.20
Zinc Scrap	4.40 to 4.60

Iron and Industrial Stocks.

NEW YORK, August 1, 1906.

The stock market has been strong for the greater part of the past week. A stimulus to values was the very satisfactory crop news, backed by the excellent reports coming from the varied business interests of the country. The new 5 per cent. bonds of the Allis-Chalmers Company sold at 80½ to 80¾ on the New York curb on Tuesday. The range of prices on active stocks from Thursday of last week to Tuesday of this week was as follows: Car & Foundry common 35⅝ to 38; Locomotive common 70⅜ to 72¾; Colorado Fuel 49½ to 55⅛; Pressed Steel common 46½ to 50¾; Railway Spring common 50¼ to 53; Republic common 27 to 29½, preferred 97 to 99½; Sloss-Sheffield common 72½ to 75¾; Tennessee Coal 152⅜ to 156; Cast Iron Pipe common 47¼ to 49⅝, preferred 91⅞ to 94½; United States Steel common 36¾ to 40, preferred 104¼ to 107⅛; Can preferred 53¼ to 56½. This morning United States Steel common sold up to 41½ as a result of the dividend declaration yesterday. Last transactions in active stocks up to 1.30 p.m. to-day are reported at the follwing prices: Can common 7¾, preferred 56; Car & Foundry common 39⅜, preferred 100¾; Locomotive common 71⅜, ex-dividend, preferred 114; Steel Foundries common 12, preferred 45⅞; Colorado Fuel 56⅝; Pressed Steel common 51½, preferred 99⅝; Railway Spring common 53⅞; Republic common 29, preferred 99¾; Sloss-Sheffield common 79¼; Tennessee Coal 156½; United States Cast Iron Pipe common 49½, preferred 93; United States Steel common 41¼, preferred 107¾.

The Dominion Iron & Steel Company.—The report of the directors of the Dominion Iron & Steel Company, Sydney, Nova Scotia, for the fiscal year ending May 31, 1906, has just been published. It shows that the company's operations resulted in a surplus over fixed charges of $652,595, against $71,532 for the five months ending May 31, 1905, and a deficit of $509,004 in the calendar year 1904. The comparisons are thus made because of the change in the company's fiscal year, which was made in 1905. Following are the details of the income account:

	Year ending May 31, '06.	Five months ending May 31, '05.	Calendar year 1904.
Profit on sales	$1,396,570	$366,063	$124,755
Rents, &c.	9,736	4,796	9,408
Total net income	$1,406,306	$370,859	$134,163
Deduct—			
Interest on first mortgage bonds	390,821	164,084	393,800
Interest on second mortgage bonds	122,572	30,779	10,079
Interest on current loans	181,139	81,048	183,088
Sinking fund first mortgage bonds	59,179	23,416	56,200
Total deductions	$753,711	$299,327	$643,167
Balance surplus	652,595	71,532	*509,004
Profit and loss deficit beginning of period	1,021,709	1,093,241	584,237
Profit and loss deficit end of period	369,114	1,021,709	1,093,241

* Deficit.

President Plummer reports to the stockholders that the production of steel has been brought up from 14,000 tons a month to 20,000 tons, and costs have naturally been improved. The capacity of the rail mill is larger than the capacity of the steel plant, but he hopes that the tonnage of the latter will be enlarged the coming winter, when the finishing department can take care of it without any trouble.

The Westinghouse Electric & Mfg. Company.—The annual meeting of the stockholders of this company was held in East Pittsburgh last week. T. W. Siemon and W. D. Uptegraff were elected directors to succeed James H. Hyde and Frank H. Taylor. The report submitted by President George Westinghouse speaks with confidence of the prospects of the company's European interests, from which no returns have thus far been received. The following table shows the sales of the company for the fiscal years 1900-1901 to 1905-1906, inclusive:

April 1, 1900, to March 31, 1901	$12,516,071.86
April 1, 1901, to March 31, 1902	17,927,339.43
April 1, 1902, to March 31, 1903	19,571,294.91
April 1, 1903, to March 31, 1904	18,569,614.21
April 1, 1904, to March 31, 1905	16,570,717.13
April 1, 1905, to March 31, 1906	24,939,602.35

For the first five months of the present calendar year the sales have averaged $2,850,000 per month, which, if maintained, will make a total for the year of above $34,000,000. The above statement does not include sales of subsidiary companies, as the Bryant & Perkins Company, the Sawyer-Mann Electric Company and the R. D. Nuttall Company, which for the fiscal year 1905-1906 amounted to about $3,500,000. The company's surplus on March 31, 1906, was $11,540,642.

The Pittsburgh Coal Company has issued a report to its stockholders for the six months ending June 30, which shows a gain in net earnings of $331,103.27, as compared with the same period last year.

Dividends.—The Peck, Stow & Wilcox Company has declared the regular quarterly dividend of 2½ per cent., payable August 1, and an extra dividend of 5 per cent. on its stock, payable August 15.

Pressed Steel Car Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable August 29.

American Shipbuilding Company has declared the usual quarterly dividends of 1¾ per cent. on the preferred stock and 1 per cent. on the common stock, and an extra dividend of 2 per cent. on the common stock, payable September 1.

Jefferson & Clearfield Coal & Iron Company has declared a dividend of 2½ per cent. on the preferred stock, payable August 1.

The United States Steel Corporation has declared dividends on the common stock of ½ per cent. for the quarter ending March 31 and ½ per cent. for the quarter ending June 30, both payable October 1. The regular quarterly dividend of 1¾ per cent. on the preferred stock has also been declared, payable August 30.

The method employed for providing cooling water for the cylinder jackets and exhaust valves of the gas engines is an interesting feature of the plant of the Citizens' Gas & Electric Company, Lorain, Ohio. In a room adjoining the main generator room a 1½-in. vertical centrifugal pump, driven by a 2 hp. induction motor, operates to supply the water to the engines, at a few pounds pressure. The pump draws its supply from the water seal of the gas holders, the supply pipe being tapped in at the bottom of the holder. Hot water is delivered from the jackets at four equidistant points in the top of the water seal, thus providing for a fairly uniform distribution of heat in it. The object of this arrangement is mainly to keep the holders from freezing during the winter, and secondarily to avoid the necessity of purchasing city water for the engine jackets.

A partial list has been published which shows that a long array of famous Europeans will visit this country in April, 1907, as guests of the Carnegie Institute, Pittsburgh, on the occasion of the opening of its main building. Invitations have been extended to a large number of eminent personages in science, art, literature and statesmanship to take part in the dedication.

San Francisco's Junk Pile.

The amount of old metal lying in the debris of San Francisco's burned district has been estimated at 600,000 tons. This mass of material is distributed over about 17,000 building lots. In the scrap metal buried and piled in the burned area there is about 60 per cent. of the value of the total wreckage. Dealers were exploring the ruins for weeks after the fire. They made estimates, lot by lot, on all the 460 burned blocks. An approximate average of the tonnage of all the cast iron and steel that is being purchased merely as junk is 400,000 tons. This includes steel girders, beams, cast iron and steel columns, sheet metal, spikes, rivets, sash weights, angle irons, gusset plates and all the great tangle of scrap that can be seen in a journey of many miles over the burned area. There are thousands of tons of steel that have not been greatly damaged by the fire. This is worth more than scrap iron, and some will be straightened and used in new buildings.

The greater part of the copper scrap consists of electric wires and electrical appliances and fixtures. In some of the big buildings that were swept by the flames there are five and ten miles of copper wire, most of it of small size. As the insulation was burned off of this wire and much of it was melted or otherwise injured, it can only be sold for its weight in copper at the scrap rate. The same is true of other kinds of copper fixtures used in plumbing or for ornamental purposes. There is a large quantity of scrap brass, in plumbing material, gas fixtures, gas pipes, door knobs and some varieties of electrical fixtures. A great deal of this copper and brass is yet to be recovered from the ruins, as there are many lots in the business district that have not been cleared. Scores of temporary buildings have been erected over uncleared lots, and will remain there for a year at least. Therefore the dealers will be purchasing scrap copper and brass for a long time. They are trying to secure it in advance, however, making prices on the uncleared lots. They estimate the tonnage of this sort of material in the ruins by getting data from plumbers and other fixture contractors on the amount of brass and copper that was put into the buildings.

Fully a score of dealers in scrap copper and brass went to San Francisco from the East immediately after the fire. A few are still there waiting for the insurance companies to allow the lots to be cleared of junk, but the majority returned disgusted at the delay caused by the methods of the insurance companies.

One concern in San Francisco has bought up all the window sash weights on the four square miles of the burned area. More than 600 tons has already been taken from the ruins. These sash weights were bought as scrap, but as they are for all material purposes as good as new they will be sold again at the usual market price. There are probably 5000 tons still buried under the debris.

One dealer bought 30 tons of Winchester repeating arms as junk, paying $4.75 per ton. These weapons were destroyed in the burning of the Winchester Arms Company's warerooms on First street, near Mission, and include all sorts of guns from small rifles to repeating shotguns. The profit that will be made from this class of junk, however, will be greater probably than from any other scrap metal, as it will be sold in small lots to dealers as souvenirs. The twisted and partly melted barrels will be sold all over the United States. Several tons of these fire ruined weapons have already been shipped out of San Francisco.

Much machinery was badly damaged by the flames, but not sufficiently injured to put it in the class with scrap that is sold by the ton. There are a great many machinery manufacturers with warehouses in San Francisco who will recover their own machinery and send it to the shops to be repaired. Down in the manufacturing district centering about Howard and Main streets the estimate is given that about $4,000,000 worth of machinery of various sorts either has been or will be rescued from the ruins.

A Virginia Manganese Operation.

The old Powell Fort manganese tract of land, situated between Seven Fountains and Woodstock, Va., passed into new hands last January, and is being operated by the H. P. Binswanger Company, 3 West Twenty-ninth street, New York. The tract consists of over 600 acres of land, and is about 2 miles in length. The mines have had a varied history. They were worked spasmodically for some years in the past by different parties, but not until they came under the management of the present owners have such extensive developments been made in the way of uncovering large bodies of ore. Numerous tunnels have been built, and at present work is being carried on in extending and deepening an open cut 500 ft. in length, so that operations are now being carried on more like a quarrying than a mining proposition. Fears were hitherto freely expressed that the manganese deposit on this property was of a pocket formation, but the company states that it is evident from the present development that a rich vein has been struck. Tunnels in each side of the open cut extending 100 ft. or more in depth, and at about 60 ft. below the top of the cut, have been opened up, showing the vein. The deposit is covered by dry soil running to an extreme thickness of 12 ft.

Most of the ore thus far obtained is of a highly crystallized character, and without being subject to any washing process, and only cobbed by hand, shows by analysis 47 per cent. of metallic manganese, and but 0.25 per cent. of phosphorus. The manganese could be increased after separating the silica therefrom. Operations at the mines thus far have been with the view of learning the character and extent of the deposits, and later the necessary plant will be installed to crush and clean the ores.

Some shipments have been made by the new owners. From an analysis of the shipments the ore has been found very desirable for special purposes, as it makes an exceptionally rich oxide. The analysis referred to showed 5.65 per cent. silica, 64.66 per cent. manganese and 0.047 per cent. phosphorus, but it is considered scarcely likely that all of the ore would contain so high a percentage in manganese or run so low in phosphorus. Pieces as large as 250 lb. have been obtained. Considerable activity has lately developed in locating manganese properties in the Shenandoah Valley, since the H. P. Binswanger Company has made its development, but no such finds have as yet been reported as above chronicled.

Steam turbine blades are usually made of cheap brass, containing 16 per cent. of copper and 3 per cent. of tin. Alloys containing zinc are said to be extremely unreliable at the high temperatures used with superheated steam, but blades containing large quantities of copper, up to as high as 98 per cent., have been found very satisfactory. A new material, containing 80 per cent. of copper and 20 per cent. of nickel, has recently been adopted as the most satisfactory blade metal which has yet been discovered. Steel blading, drawn in the same way as the usual brass section, has been used with fairly good results. The process of drawing turbine blades gives an extremely tough skin to the metal, increasing the tensile strength and also decreasing the effects of erosion. In the latest designs the calking strip has been omitted in favor of a shroud over the ends of the blades, the latter affording much better security against stripping.

In May the Cape to Cairo Railroad reached Broken Hill, which is 374 miles north of Victoria Falls and 2016 miles from Cape Town. From Kalomo, 93 miles north of Victoria Falls, to Broken Hill, 281 miles, the track was laid in 346 days, but as no work was done on 99 days, the actual laying of rails went on at an average of more than a mile a day. The greatest day's work was 5¾ miles laid between daylight and dark. From 3000 to 5000 natives and 350 whites are constantly employed.

Ore Transport Hampered.

Delays in the Completion of Docks and Cars.

DULUTH, MINN., July 28, 1906.—There will be surprise on the part of many at the diminution of shipments from old ranges. This has been very marked. Escanaba shipments have held up very well, though they show some decrease, but that part of the ores shipped through Escanaba which comes off the Menominee range is about the same as a year ago. The Marquette range shows a marked drop from last year and is about 250,000 tons short. Ashland is running about even. The Mesaba range is furnishing about all the increase, making a record far ahead of all past years, even though handicapped by a scarcity of transportation facilities on some lines, the Great Northern particularly. The company's car orders of last winter are only partly filled. The Duluth, Missabe & Northern's No. 4 dock, to be the largest ore pier in the world, was to be in service by June 15, but it will be fall before the pier will ship ore. Sawmills have been unable to turn out the required timbers. The remaining roads along the lake that are rebuilding old or constructing new ore piers are also delayed, this being particularly a hardship to the Duluth, South Shore & Atlantic road at Marquette.

While the increase in lake shipping orders for this year and next is sufficient to add 10,000,000 tons to the annual capacity of the lake fleets, there is no sign of any reduction of freights. It looks now, indeed, as though there might be a runaway lake freight market this fall in grain. The new tonnage coming out along the lakes this summer alone will be able to increase the freight handled this year by about 3,000,000 tons, and this is no small item.

New Menominee Mines.

Much activity is noted in the Menominee country, and with the passage of time this is not diminished; but new explorations start, new drills are put at work, and more prospects reach the point where they can be called mines. Among the new properties is the Fairbanks, which enters the list of shippers after an absence of 20 years. It will make a fair product this season. A number of winter stock piles on that range have been cleaned out, especially at the properties around Crystal Falls. That town has changed its appearance, and is now very lively and flourishing. In the undeveloped region around Paint River and north of Iron River the Oliver Iron Mining Company is taking up exploration work and will carry on extensive operations, it is rumored.

Pickands, Mather & Co. have organized the Athens Mining Company, capital $1,000,000, to handle their operations in the Menominee District. This concern has been developing very fast there and is now second of all independent operators, its mines including the Hemlock, Baltic, Caspian and a number of newer properties and explorations, notably the Fogerty and tracts at Stambaugh. The Caspian is proving one of the very large mines of the Menominee region, while the Baltic is an important property. Much exploration is now under way at Stambaugh, and the indications are said to be excellent. Pickands, Mather & Co. have an added incentive for ore discovery from the fact of their close affiliation in ore with the Lackawanna Steel Company.

A Mesaba Sale to Buffalo Interests.

A sale of Mesaba lands is now being closed to the Buffalo & Susquehanna interests that shows how anxious consumers are for iron. It is of a tract just north of the old Mesaba Chief mine and partakes of the lean and mixed character of that deposit. It contains, so far as now explored, about 2,500,000 tons, mostly of an ore that must be washed, and carries too much phosphorus to permit its use in the Bessemer process. In addition to the State's 25 cents royalty there is a second 25 cents a ton, with a minimum of 100,000 tons and a cash bonus of $70,000 for the lease. This bonus is equal to about 3 cents a ton cash on all ore, so far as discovered, and including ore that runs far too low to be available in its present state.

A sale of some 14,000,000 tons of medium grade merchantable Mesaba ore is now under consideration to a new interest and is liable to be closed shortly. In addition to this rumors are afloat of another important deal.

Steam shovels have started stripping and developing the Holman mine of the Oliver Iron Mining Company on the western Mesaba in preparation for a heavy movement of ore next spring. Stripping at the adjacent Canisteo mine of the same company begins in a few days.

Noteworthy Shaft Sinking.

At Negaunee the Prince of Wales mine is sinking its new shaft rapidly. The old shaft is 450 ft. deep, and to that depth the new one will be an enlargement of the old, but the larger hole will be driven on down to 650 ft. The work began in May and is going on at the rate of about 100 ft. per month, including timbering and reconstruction. The shaft is 8 x 18 ft. and will have three compartments. It will be a main avenue for that part of the Regent mines of the Oliver Company. Another great shaft now nearing completion is the Ludington C, which the Oliver Company has been sinking several years at the Chapin mine, Iron Mountain. It is a vertical steel lined shaft, 1000 ft. deep and 10 x 23 ft. inside. It has four compartments, one of which is 10 x 11 ft., and it will be a main hoisting way for the mine, as well as a great pumpway. The enormous Cornish pump that has been at Chapin for so long has been installed in this shaft. This pump and its rods weigh in the neighborhood of 900 tons. Chapin is a caved mine and gradually most of its shafts have come within the caving area, but the new steel shaft is designed to be permanent and has been so located that it is not within the zone of future caving operations.

Champion mine, Marquette range, has begun shipments and about 300 men will be employed underground as soon as a force can be collected. This is something of a task, for the town has been idle for some time and most of the miners have drifted to other centers. D. E. W.

Labor Notes.

The strike of the molders of Boston and vicinity is practically a closed incident, the men in all the foundries having returned to work with the exception of one of the jobbing foundries, where the company is standing out for an open shop. In the other foundries the union men went back under an amicable agreement with their employers.

At Nashua, N. H., the strike of the union molders is still on, but the foundrymen express themselves satisfied with conditions in the establishments, each week showing a gain in working force.

The Acme Steamship Company, which owns the steamers Augustus R. Wolvin and James C. Wallace, placed an order last week with the American Shipbuilding Company for a new lake steamer, to be 532 ft. over all, 516 ft. keel, 56 ft. beam and 26 ft. deep. Its capacity will be 9500 tons. This makes 32 vessels ordered for next year's delivery, the American Shipbuilding Company having 21 of these, the Great Lakes Engineering Works seven, and the Toledo Shipbuilding Company four.

The necessity of tracing or inking in drawings, when blue prints are required, is avoided by a new process employing a machine recently patented, which renders any ordinary paper transparent, and it is found that good pencil lines give a sufficient contrast to produce good prints in less time than is usually required with an ordinary tracing. Drawings subjected to the treatment are both waterproof and mildewproof, while the paper, which assumes a slight yellow tint, is not left greasy or oily and will not stain the blue printing paper. Corrections may be made on the drawings after the treatment by first cutting out the surface by means of naphtha. When alterations are completed the whole sheet is run through the bath and the transparency restored.

The Machinery Trade.

NEW YORK, August 1, 1906.

The heavy demand for machine tools is clearly shown by the high prices paid for tools at the auction sale of the equipment of the Shaw Machine Company last week, when many machines brought prices equal to or above the present market price of new ones. These high prices were practically premiums paid for quick delivery. Machinery houses are literally overrun with orders for early delivery, which have to be turned down. Some of the railroads have attempted to place good orders on these conditions, but have been unsuccessful, one large company refusing such an order from one of its best customers for three or four $4,000 machines. Reports from the West indicate the same prosperous conditions in that section. Manufacturers of milling machines have made another increase in prices from 5 to 10 per cent., and it would not be surprising to hear of an increase on other tools before long.

There are excellent opportunities for the sale of leather working machinery in Mexico, judging from advices given by one who is familiar with trade conditions there. It is stated that it hardly pays to import completed products of leather from the United States, owing to the first high cost and the fact that added duties and freight charges bring the total costs up to a figure in wide comparison to the original cost of similar raw goods in Mexico. It is stated that leather is by no means as high there as it is in this country, and parties who have heretofore been importing such things as shoes, harness, leather fillets, &c., are now making inquiries looking toward purchasing machinery for making up such articles there. Some machinery men who have become aware of the opportunities are doing considerable business with the Mexicans in the way of leather working machinery, and their initial entry in the field will probably give those in that particular line and other machinery lines a chance to get trade, as it invariably follows that when one branch of the machinery trade successfully invades a foreign market it is much easier for those in other lines to get a hearing.

Panama Canal Work.

The machinery trade is watching with interest the developments in the Panama Canal work, and there is much speculation as to how Chief Engineer John F. Stevens will decide to carry out the actual excavating operations from now on. A number of well-known machinery houses have been keeping in close touch with the canal zone for the last few weeks, with an idea of getting a line on just what will be done in that respect, and the situation is one that is causing considerable speculation in the trade. Those who are close to the engineers in charge of the proposed operations state that Mr. Stevens is now considering the advisability of letting out the work in several contracts, and allowing contractors to take the responsibility of making their contracts good as well as looking after the laborers under their charge. On the other hand, the question of having the Government continue to supervise the entire job is being earnestly considered. It is hardly thought there will be many disappointments in the trade if the Government decides to do the work itself, as the disposition of business so far made by the Isthmian Canal Commission has been very just and has resulted in quite an extensive distribution of orders. It is said that if several contractors undertake to dig sections of the canal there would necessarily be needed as many distinct outfits of machinery. Should the Government undertake the entire job there would be no importation of second-hand outfits to take the place of what would otherwise be new machines, nor would any favoritism be shown in awarding contracts, as might occur should a private corporation take up the work. It is said that, judging from the Government's present efforts toward taking care of the men in the canal zone, there will be a large outlay for equipment for the laborers' needs if the Government undertakes the entire job, and considerable money will be well spent in ways that might otherwise be gotten around by private interests by utilizing makeshift outfits and material. Until a decision is reached regarding the distribution of the work the machinery houses who are keeping close to developments in the Isthmian Canal Commission will hardly know what to expect in the way of business. Those who are familiar with the situation state, however, that there will be much needed in the way of all classes of machinery, no matter which way the chief engineer decides to handle the job, and in any event the trade can look for a goodly number of orders from that source from now on.

New Erie Plant at Hoboken.

The Erie Railroad is preparing to build a plant at Hoboken, N. J., to take care of its floating equipment, and when it is completed all of the work of alteration and repairs on the company's boats that can be done above water will be taken care of there. A large force of men is already at work dredging and building the docks to be constructed in connection with the scheme, and they are also preparing for the installation of a marine railway on which small boats can be run at high tide for repairing the hulls. The company will have no dry dock at the yards and no provision has been made for repairing the bottoms of the larger boats, although anything that can be done above water will be executed at the plant. While the plans for the buildings to be erected have not been entirely worked out, the company has made an appropriation of $55,000 for the first cost in preparing the cove at Eighteenth street, where the yards and machine shops will be located. It is planned to erect in addition to ordinary marine shops an extensive machine shop and blacksmith shop, as well as other departments, including one which will be given over to the interior finish of boats and the repainting of the floating equipment. The company has a fleet of 524 boats, which includes ferryboats, tugs, coal boats, lighters, &c. It is proposed to erect a plant large enough to keep all of them in good repair, and this will mean the equipment of a large machine shop, as it is proposed to take care of any alterations that will be necessary to the machinery equipment of the boats. The machine shop will be specially fitted up so as to take care of repairs to the power apparatus. The company also proposes to do some new work at the yards, although just what extent that will be gone into is not known as yet. None of the machinery equipment for the plant has been purchased, it is stated, but it will not be long before a list of requirements will be out, as it is proposed to hurry the work on the new plant and if possible get it in shape to do at least some work next winter. The dredging work is already under way, as are the preparations for improving the dock facilities at that point, and very shortly contracts for the buildings will be awarded. The Erie Railroad has inquiries in the market for a few machine tools.

Several times we have had occasion to refer to the new shops to be erected at Moncton, N. B., by the Intercolonial Railway Company, plans for which have now been completed. We are informed that the machinery that will be required at the present time has been purchased, but it is thought that when the buildings are well under way arrangements will be made to secure additional machinery. In all there are to be a dozen or more buildings, the six principal mechanical shops to be under one roof. These are the tool room, brass shop, bolt shop, &c., 44 x 355 ft.; machine shop, in two bays, 135 x 355 ft.; smith shop, 75 x 300 ft.; engine shop, 80 x 375 ft.; boiler erecting shop, 50 x 300 ft.; bolt shop, 50 x 300 ft.; the latter four buildings heading into the machine shop. In addition there is to be a car repair shop, 100 x 360 ft.; passenger car paint shop, 100 x 360 ft.; freight car repair shop, 132 x 360 ft.; planing mill and carpenter shop, 80 x 200 ft.; storehouse and office building, 50 x 200 ft., and several accessory buildings.

There have been no inquiries of interest to the tool and machinery trade from the purchasing department of the Pennsylvania Railroad Company during the past week, but a great many of the bids made upon the annual tool and machinery programme have been accepted and much of the business included in the list of inquiries has been closed. Requisitions for the remainder of the programme will doubtless come along promptly, and so much of the programme as it is intended to fill will be settled soon.

The York Street Railway Company, York, Pa., is receiving bids on the machinery it will require for equipping its new building, 50 x 265 ft., which is to be used as a car barn and repair shop. Plans have been completed and the company is about ready to receive bids for constructing the building.

Columbus & Hocking Machine Tool List.

A machine tool list covering about 12 tools was sent out to the trade the past week by the Columbus & Hocking Clay & Construction Company, an allied interest of the Columbus & Hocking Coal & Iron Company, Columbus, Ohio, which is to build one of the largest brick plants in the country at Greendale, Ohio. The entire plant is to be operated by electricity, which will be supplied from a central power station, where a producer gas plant will be installed, also five 200-kw. gas engines. The machine tools on which the company is now receiving bids are to be electrically operated, and the bidders are requested to mention the horsepower required to operate each machine. These tools are required for the machine shop only, the list covering one 36-in. heavy pattern engine lathe, with 12-ft. bed; one 12-in. heavy pattern engine lathe, with 4-ft. bed; one 24-in. shaper, one 42 x 42 in. by 16 ft. planer, one 36-in. radial drill, one 24-in. upright drill press, one 10-in. sensitive drill, one universal milling machine, longitudinal feed 24 in., transverse feed 8 in.; one tool grinder, two wheel grinders and a hack saw. Specifications may be had on application to R. A. Magley, general manager.

It is expected that the Gardner Engineering Company, 136 Liberty street, New York, will soon come into the market for machinery for equipping a plant it proposes to erect somewhere near New York. The company is looking about

for a 2-acre site, and will probably select one in New Jersey near the water front. The company manufactures special machine tools, and it is making preparations for the erection of a plant that will at first give employment to about 200 men. Plans for the proposed buildings have not been prepared as yet, but it is the company's intention to erect concrete structures of modern design. It is the intention to select a site and commence construction as soon as possible.

Philadelphia Machinery Market.

PHILADELPHIA, PA., July 31, 1906.

The amount of business transacted in the local machinery market during the month of July has been generally satisfactory to the trade, and considering the season of the year has been materially greater than was expected. Several good orders have been placed with local merchants and manufacturers by the Pennsylvania Railroad on account of its list, and a large amount yet remains to be placed. The demand for individual tools has been good and sales of a number, particularly those of the medium and lighter class, have been reported.

Inquiries continue in good number, but there is considerable hesitancy displayed on the part of some of the prospective buyers in closing up promptly, this being particularly noticeable in heavy tools of both the standard and special types.

Manufacturers of machine tools and machinery of every class continue, almost without exception, very busy. In some cases sufficient work is on hand to keep them actively engaged for months ahead, and in some lines and sizes of tools it is almost impossible to get deliveries during the remainder of the year. This condition alone has considerable influence on the placing of orders, which have been frequently delayed until every manufacturer is approached in the hope of getting some concessions on delivery.

The foreign demand has improved somewhat along certain lines, mostly, however, for special tools, and several manufacturers have recently booked orders for export.

Boilers and engines, both new and second hand, have not been in strong demand the past week. A good volume of business is under consideration, but orders do not develop as rapidly as might be desired. Some high power installations which were expected to close before this are still in abeyance, but may develop into orders at an early date.

The demand for second-hand machine tools continues good. Buyers who must have tools, if for temporary use only, are, judging from recent sales made, willing to pay good prices for prompt delivery of desirable tools; but in many cases dealers find it hard to supply the tools wanted, although stocks are generally maintained in fairly good shape.

The demand for iron and steel castings continues active, and many foundries find it difficult to meet the demands of their customers for early deliveries. Steel casting plants are no doubt more behind in shipments than the general average of the gray iron foundries, although considerable complaint is heard on the part of some manufacturers on their inability to get iron castings promptly.

Walter J. Wagner, who for a number of years was connected with the purchasing department of the Bethlehem Steel Company, Bethlehem, Pa., has accepted a position with Manning, Maxwell & Moore of this city, where he will have a general supervision of the inside work. Several other additions have recently been made to the force of this concern, so as to keep pace with their rapidly increasing business.

The Philadelphia Carriage Bolt Works, Thomas P. Skelly & Co., Twenty-third and Callowhill streets, recently partially destroyed by fire, will be rebuilt at once. The finishing department suffered the most from the fire, and much of the machinery in this department will have to be rebuilt and in other cases replaced with new tools. The forging department was only damaged by water, and the machinery in this department was but slightly injured. Just what new tools will be needed has not yet been decided upon.

Roydhouse, Arey & Co., to whom the contract was awarded by the Baltimore & Ohio Railroad Company for its new shops at Thirty-sixth and Jackson streets, have begun work on the operation, which includes a one-story oil and storehouse, 40 x 105 ft.; a two-story yardmaster's office, 30 x 60 ft.; a one-story smith and machine shop, 60 x 254 ft.; a two-story trainmen's and shopmen's building, 34 x 85 ft.; a one-story roundhouse, 96 x 425 ft., with an 80-ft. turntable; a one-story transfer shed, 20 x 48 ft.; a coal trestle, 837 ft. long; an ash pit, 48 x 100 ft., and an office, toolroom, &c., 16 x 166 ft.

Frank Toomey, machinery merchant, reports a very good demand for the season of the year, for second-hand machine tools, particularly those of the lighter and medium standard types. Heavy tools of the more desirable classes are scarce, and there is a tendency toward higher prices.

I. H. Johnson, Jr., & Co. continue busy. The past month has been exceptionally good in point of orders taken, which have been for all kinds of lathes, some ranging from 60,000 to 100,000 lbs. each. Orders on hand are sufficient to keep the plant actively engaged for a long time without interruption. Deliveries recently have covered a wide range of sizes as well as destinations. A number of lathes have been shipped to the New England and the Middle Western States, some going to large steel plants in the Pittsburgh and local territory. A 60-in. lathe with a 30-ft. bed, weighing in all over 70,000 lbs., will be shipped at an early date to the Pacific Coast.

The E. H. Mumford Company, manufacturer of foundry molding machines, keeps quite busy, there being a good demand for power ramming and split pattern machines, as well as combination jolt and power squeezing and combination jolt ramming and pattern drawing machines. Orders for a number of concoidal sand mixing machines have been booked, while a number of split pattern machines of various sizes will shortly be shipped for export to England. Inquiries are reported quite numerous, with resultant orders good. Recent deliveries by the company include shipments of a number of machines to the New England and Middle Western States, as well as to those in the local and nearby territory.

The Wm. Cramp Ship & Engine Building Company launched successfully to-day the 10,000-ton steamship Momus, one of the three vessels of equal size building for the Southern Pacific Railway Company for service between New York and New Orleans.

The Newton Machine Tool Works, Incorporated, notes a good demand the past month for its general line of tools, more particularly, however, for slotting machines, slab milling machines and heavy floor boring, milling and drilling machines. Orders have been booked from electrical machinery plants, railroads and bridge shops for rotary planing machines, while steel casting plants and structural steel plants have bought steel foundry and structural cold saw cutting-off machines. A number of rail plant tools have also been sold for export to Japan. All departments of the plant are fully occupied, and from the volume of inquiries received it is considered that a good volume of business will continue to develop during the remainder of the summer. Some recent shipments include portable tools for a Western electric company; bridge tools for the Pacific Coast; cylinder boring machines, radial drills and centering machines for railroad shops in New England and in the Middle West, and a large number of cold sawing machines of various types.

Chicago Machinery Market.

CHICAGO, ILL., July 31, 1906.

Owing to the heavy demand for milling machines and the inability of manufacturers to make early deliveries prices to the trade have again been advanced, most of the builders having increased quotations 5 per cent., although two are reported to have made an advance of 10 per cent. Other tools remain unchanged in price, and shipments on drills, lathes, planers and shapers can be had in from 60 to 90 days. Satisfactory deliveries of boring drills cannot be made by any of the builders, six months being considered early shipment. Milling machine manufacturers are booked ahead practically as heavy as the boring mill makers, and the late advances reflect the actual conditions of the trade. In the absence of large purchases for individual industrial operations, the buying of miscellaneous tools in small lots shows no abatement, and the volume of business transacted by local dealers during July, while not as large as June, shows a comfortable increase over the same month last year. Stocks of local dealers show a steady decline, despite their efforts to maintain an assortment of sizes, and from present indications no accessions will be possible during the next three or four months. One dealer who aims to carry a $100,000 stock now has $40,000 worth of tools on his floor, made up largely of the smaller sizes. Trade in second-hand equipment is unprecedentedly heavy, and prices on desirable tools for prompt shipment are almost on a par with new tools.

Owing to the heavy increase in the demand for small steel castings, not only for railroads, but from manufacturers of automobiles and gas and gasoline engines as well, the Scullin-Gallagher Iron & Steel Company, St. Louis, has decided to erect a new foundry, to be devoted exclusively to the manufacture of light castings. The building will be of steel construction, 80 x 300 ft., and the steel will be made in two Tropenas converters of the J. E. Fisher type. Their construction will be unique. Drop bottoms, similar to the Bessemer type, will be provided, which will greatly facilitate operations. The iron will be melted in two cupolas, of

a rated capacity of 9 tons an hour, and the blast will be furnished by two No. 5 P. H. & F. M. Roots Company blowers, one of high pressure and the other of low pressure type. The ultimate installation will consist of four converters, and the plant is laid out with these additions in view. The converters will have a capacity of 6 tons an hour. Two 5-ton electric cranes will travel the length of the main bay, contracts for which will be shortly awarded. Owing to the growing demand for heavy castings, it has also been decided to add another basic open hearth furnace of 25 tons capacity to foundry No. 2. Considerable cleaning machinery will also be purchased. Plans are now being prepared for a modern office building, 40 x 104 ft. and three stories.

The Henney Buggy Company, Freeport, Ill., is having plans prepared for two buildings, one of which will be five stories, 96 x 20 ft., and the other three stories, 96 x 119 ft. The three-story building will be occupied as a woodworking department, and considerable new machinery will be purchased for its equipment. A system of dry kilns will be installed, and this equipment has already been purchased from the National Dry Kiln Company, Indianapolis, including trucks, rails, pipes, &c. The five-story building will be used principally for storage purposes, and to it will later be annexed a one-story building, 30 x 70 ft., for exclusive use of tiring wheels. Plans and specifications for the buildings have not yet been fully completed by the architect for the erection of the buildings, but will be within a short time, and will then be submitted to contractors.

The N. S. Sherman Machinery Company, Oklahoma City, Okla., is making an addition to its machine shop, which will be 50 x 100 ft., and have a wing 36 x 45 ft. For the equipment of this addition a pipe and bolt machine, with a capacity up to 6-in. pipe and 2-in. bolts, has been purchased, and the company is still in the market for an engine lathe, drill press, shaper, cold saw, punch and shear.

The Sure Hatch Incubator Company, Fremont, Neb., which operates a well equipped factory at Clay Center, Neb., is planning the removal of the plant to Fremont. Additional power will be put in the new factory, including a 50-hp. steam engine and 80-hp. boiler; also steam heating system, to include condenser, heater, automatic feeders, &c. Additional woodworking and sheet metal working machinery will also be installed, such as planers, matchers, scrapers, sanders, mortisers, power presses, punches and dies, power circle shears, grooving and beading machinery. Full plans have not yet been decided upon in regard to the new plant, but complete installation of equipment in readiness for operation by December 1 is expected.

D. C. Stover and others of Freeport, Ill., will shortly organize a company, to be known as D. C. Stover & Co., for the manufacture of marine engines. The company will have a capital stock of $50,000, and will immediately erect a three-story building, 60 x 120 ft., for manufacturing purposes; foundry, 80 x 150 ft., and a blacksmith shop, 40 x 80 ft. The plant will be operated by electric power. Mr. Stover is in the market for machinery for almost the complete equipment of the plant. Associated with him in the new enterprise will be Jacob Stover and Frederick Dawson.

The Gerson-Carey Company, Lansing, Mich., will erect a brass foundry, which will be 30 x 105 ft. The following equipment will be required: One or two 16 or 18 in. back geared turret lathes, one 20 to 25 in. drill press and one bench drill press. A hand power traveler will also be required, with hoist of about 1000 pounds capacity. It is aimed to have the plant ready for occupancy not later than September 15.

The Western Electric Company, Seattle, Wash., has been incorporated, with a capital stock of $25,000, the incorporators being George E. Wright, P. J. Aaron and E. M. Scribner. Until stock is received business will be handled temporarily from an office at 439 New York Block, shipments being made through branches at San Francisco, St. Paul or Chicago. Within a short time, however, a permanent office will be established, carrying a complete stock of electrical supplies and machinery.

New England Machinery Market.

WORCESTER, MASS., July 31, 1906.

Machine tool men, both manufacturers and dealers, are mightily pleased at the prices brought at the auction sale of the equipment of the Shaw Machine Company, Lowell, Mass., last Wednesday and Thursday. In not a few instances the tools sold for more than the present market price, and in many more instances the prices were in advance of those which the company paid when it equipped the works a year ago, before recent advances went into effect. The sale had been awaited with keen expectancy as an indication of the true status of the market, considered apart from the prices made by the manufacturers. It was demonstrated in the sharp bidding participated in by many users of machine tools that current prices are not by any means in advance of the market; that many men would be willing to pay a material premium for immediate deliveries, and that there is little or no prospect that present conditions will change for a long time to come. The gatherings during the two days' auction were very representative ones, including buyers from distant cities in this country and from Canada, where a material number of the tools will be shipped. Most of those who attended had clearly defined for themselves a limit of price they would pay, and consequently there were many disappointments; in fact, disappointments were much more numerous than purchases. Had the equipment been very much larger it is probable that the high prices would have been nearly if not quite maintained to the end of the longer list.

The tools sold were all second hand, in that they had been used to some extent, with a few exceptions which were delivered too late to be put into service before the failure. Normally the cut from new machine prices would have been a very material one throughout. Quite a number of machines were purchased second hand by the company, and in some instances were by no means nearly new, yet they brought good prices. For example, a Woodward & Powell 26 x 26 in. planer brought $575, though it had a bad crack in its bed and was otherwise the worse for wear. Even tools which can be bought for quick delivery in the open market were sold at prices close to and even equal to the cost of new machines. Rivalry was keen for many of the machines. Two of the Potter & Johnson automatics, which sell to-day at $1740, went under the hammer for $1687.50, and two others, selling for $1450 in the market, brought $1350. Most of the milling machines sold above the present quoted price, and so did a Brown & Sharpe screw machine, a Cleveland automatic screw machine and a Brown & Sharpe surface grinder. A Flather open side planer, which cost the Shaw Company $1800, brought $2000, and a Jones & Lamson turret lathe sold within $5 of the present price. These are instances of what the sale revealed in the way of demand for machine tools, the lesson being emphasized by the fact that the bidders came from all parts of the country, east of the Mississippi and as far south as Baltimore and Philadelphia and north into Canada. New York was especially well represented, and a very large number of the prominent manufacturers of New England were included in the 600 or 700 individuals who were present during the two days of the auction. The dealers did very little buying, occasionally picking up a tool when circumstances permitted, and in some cases immediately disposing of their purchases on the premises. The second-hand dealers were in evidence only in being present.

A considerable buyer was W. M. Wood, the head of the American Woolen Company, who is a large creditor. He purchased the plant for $65,000, very much below its cost, and a considerable amount of the machinery. Mr. Wood stated that he should dispose of the property and his purchases of machinery, but an impression prevailed that he might change his mind and carry on the business of manufacturing worsted machinery, which was the product of the Shaw Company. The company had a very large contract with the American Woolen Company for worsted machinery, the carrying out of which was only begun, and the deduction was made that Mr. Wood might decide to continue the business in order to provide the machinery which the company would have furnished the American Woolen Company had it not been for the failure. If this deduction should prove to be correct, if Mr. Wood should change his mind, it would probably be necessary to purchase a considerable amount of machine tools to replace those which were bought by other bidders.

The stock and unfinished parts of machines did not, as a whole, realize good prices. Sixty-seven tons of castings brought $11,000, 4-5 cent. a pound. Some of the steel was bid in at a satisfactory figure, but other parcels went low, as, for instance, a lot of high speed steel, which sold for about 8 cents a pound. The small tools in the shop brought average prices.

The results of the sale, as tabulated below, will give some idea of the market as revealed by the auction. Only a portion of the tools are included. Some of the sales as given represent the prices of a single one of a lot of machines of its type, and in such instances an average figure was selected. In a few instances the present price cannot be given, because of very recent changes:

	Auction price.	Market price.
Potter and Johnson automatic	$1,200	$1,350
Potter & Johnson automatic	1,187.50	1,350
Two Potter & Johnson automatics, triple gear feed	1,587.50	1,630
Becker-Brainerd 24-in. automatic gear cutter	740	780
Binsse horizontal boring machine	1,475	1,500
Carter & Hakes bench miller	92	100
Brown & Sharpe No. 2 automatic screw machine	990	900
Jones & Lamson 2 x 24 in. flat turret lathe	1,175	1,180
Cleveland 2-in. automatic screw machine	975	900
Pearson No. 2 hand screw machine	285	200
National-Acme 3-in. four-spindle automatic screw machine	1,675	2,000
Pawtucket four-spindle bolt machine	350	550

Three Diamond roll grinders, each	325	490
Two Foote-Burt four-spindle adjustable rail drilling machines, each	437.50	475
Wagner 18-in. cold saw	250	375
Ryder seven-spindle broaching machine	462.50	650
Ryder horizontal four-spindle drilling machine	250	250
Whitney No. 6 hand milling machine	165	185
Blount speed lathe	40	48
Six Bardons & Oliver No. 4 screw machines, each	400	420
Four Bardons & Oliver No. 4 screw machines, with friction heads	400	540
Flather planer, 30 x 30 in. by 8 ft.	805	945
Flather open side double head planer, 44 x 44 in. by 8 ft.	2,000	2,100
Chandler double head planer, 44 x 44 in. by 8 ft.	1,762.50	...
Gilbert & Barker oil furnace	900	1,190
Fisher alligator shears	355	500
Four Flather back geared plain turning lathes	260	...
Seven Fay & Scott 13 and 14 in. lathes, each	160	...
Excelsior swaging machines	440	585
Beaudry 125-lb. power hammer	315	400
Billings & Spencer 500-lb. drop hammer	750	950
Ryder No. 5 hammer	475	465 and duty.
Bradley 60-lb. cushioned helve hammer	425	480
Barnes 26-in. drill	142	170
Barnes 20-in. drill	72.50	95
Gould & Eberhardt 20-in. shaper	425	450
Lapoint splining machine	250	350
Bayldon combination grinder	325	350
American 21-in. turret lathe	1,425	1,500
Lodge & Shipley patent head 18-in. lathe, 10-ft. bed	675	650
Lodge & Shipley patent head, 16-in. lathe	485	...
Cincinnati No. 1 tool room grinder	275	290
Bath universal grinder	375	550
Brown & Sharpe surface grinder	412.50	350
Two Washburn Shops sensitive drills, each	40	45
Washburn Shops twist drill grinder	52.50	65
Blount 20-in. wet tool grinder	67.50	80
Prentiss 14-in. lathe	287.50	285
Prentiss 17-in. lathe	305	300
Prentiss 14-in. lathe	250	240
American 16-in. surfacer	170	149
Clement 16-in. double iron saw table	170	162
Egan 30-in. sanding machine	187.50	385
American 36-in. band saw machine	160	140

The specialization of machinery for automobile manufacturing continues to develop rapidly. Not a few of the builders of machine tools have given much attention to this branch of the business since it became evident that the automobile industry is one that is bound to endure; that from its very nature there is little danger that it will follow the career of the bicycle business and meet with a slump from which it cannot recover. Many machine tool catalogues contain these special machines, which have become parts of regular lines, and the demand for them is fully meeting expectations. This is specially true with tools which accomplish accuracy of machining and grinding. The grinding machines alone would make a formidable list were they got together. The automobile people are buying a good many tools at this time, especially with a view to getting in their orders early enough to assure deliveries in time to meet the needs of the business.

The garages are good customers this season. Not many high cost machines are sold to this trade, because they are generally not needed for repair work. But the business which has come and promises to come from this source makes a large total. Some dealers make a specialty of the garage trade and have made money from it. Oftentimes deliveries are better on the tools needed by the garage than on higher cost machines.

The newly organized Page Boiler Company, Mystic, Conn., has secured an option on a piece of land in that place and will erect a complete boiler manufacturing plant on the premises, including foundry and machine shop. The company will manufacture boilers, under patents issued to the late W. H. Page, and radiators. It is incorporated under Connecticut laws, with capital stock of $50,000, of which $10,000 is preferred and the balance common. W. H. Page, second, will be the manager of the business. The company states that it already has orders for 850 boilers on its books, which will have to be manufactured for the present by outside parties. It is planned that the new plant will have a capacity of from 1000 to 1200 boilers a year. Mr. Page states that the company will be in the market for a considerable amount of machine tools, including radial drills, upright drills, lathes, &c., and for an engine.

The G. H. Bushnell Press Company, Thompsonville, Conn., manufacturer of oil mill machinery, presses and bent piping, is to increase the capacity of its works by the immediate erection of an addition 40 x 120 ft. It is planned to build a large manufacturing building, 88 x 250 ft., as an extension of the main building of the plant; but plans for this building are not completed, and consequently a structure of a temporary nature will be built to take care of the immediate need of more room. The company states that it may require a generator of from 20 to 50 hp., and several motors of from 2 to 10 hp. each; but it may be decided to purchase second-hand machines, owing to the temporary nature of the building in which they will be located. The company has recently added the manufacture of pipe bending to its lines, the product to be used particularly in steam engine and automobile work.

Government Purchases.

WASHINGTON, D. C., July 31, 1906.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 14 for motor, valve reseating machine, pipe cutters, hydraulic jacks and other supplies for the Portsmouth, Boston, Newport, New York, Annapolis, Washington and Norfolk navy yards.

The Isthmian Canal Commission will receive bids until August 9, circular No. 320, for pipe bending machines and other supplies.

The Isthmian Canal Commission will soon ask bids for two centrifugal pumps, two 150-hp. water tube boilers, one portable hand test pump, 10 earth spreaders and other supplies.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 21 for hydraulic jacks, motors, pneumatic punch, bilge pumps and other supplies for the Mare Island and Puget Sound navy yards.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until August 7 for air drills, shaper, lathes, crushing machine and other supplies for the Eastern navy yards.

The following bids were opened July 24 for machinery for the navy yards:

Bidder 9, Baker & Hamilton, San Francisco, Cal.; 10, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 12, F. S. Banks & Co., New York; 15, Babcock & Wilcox Company, New York; 27, Caldwell Bros. Company, Seattle, Wash.; 29, Cleveland Punch & Shear Works, Cleveland, Ohio; 35, James Clark & Co., Louisville, Ky.; 41, Wm. Wirt Clark & Son, Baltimore, Md.; 45, Crocker-Wheeler Company, Ampere, N. J.; 49, Drew Machinery Agency, Manchester, N. H.; 51, Dunham, Carrigan & Hayden Company, 131 Kansas street, San Francisco, Cal.; 56, Erie Foundry Company, Erie, Pa.; 60, Fox Machinery Company, Grand Rapids, Mich.; 63, Walter H. Foster Company, New York; 65, Fairbanks Company, New York; 67, Gamwell & Wheeler, Seattle, Wash.; 68, General Electric Company, Schenectady, N. Y.; 72, Garvin Machine Company, New York; 74, Richard W. Geldart, New York; 81, Handlan-Buck Mfg. Company, St. Louis, Mo.; 82, Harrod, Rickard & McCone, San Francisco, Cal.; 87, Hallidie Machinery Company, Seattle, Wash.; 88, Hendey Machine Company, Torrington, Conn.; 106, Lucas Machine Tool Company, Cleveland, Ohio; 112, Theodore Linington, Jr., New York; 121, W. B. Mershon & Co., Saginaw, Mich.; 122, Manning, Maxwell & Moore, New York; 124, John W. Masury & Son, New York; 125, Montgomery & Co., New York; 127, Manhattan Supply Company, New York; 133, Newton Machine Tool Works, New York; 134, New Jersey Zinc Company, New York; 151, Prentiss Tool & Supply Company, New York; 157, John B. Roach, Brooklyn, N. Y.; 158, Rickets Engineering Company, Washington, D. C.; 162, H. A. Rogers Company, New York; 174, Sanson & Rowland, Philadelphia, Pa.; 177, Sprague Electric Company, New York; 178, Sherman-Brown-Clements Company, New York; 195, Westinghouse Electric & Mfg. Company, Baltimore, Md.; 201, J. C. Martinand & Co., San Francisco, Cal.

Schedule No. 1.

Class 1. One flat turret lathe—Bidder 87, $1884.

Class 2. One toolroom lathe— Bidder 87, $947; 134, $977.50.

Class 3. One wood turning and pattern makers' lathe—Bidder 27, $712.12; 60, $414.50; 87, $460; 122, $675.

Class 4. One standard patent head lathe—Bidder 87, $2720; 134, $2936; 158, $2325.

Class 5. One shop saw—Bidder 35, $113; 87, $127.50.

Class 6. One band resaw—Bidder 27, $2014.28; 81, $2200; 87, $1127.20; 121, $1369.90.

Class 7. One metal band saw machine—Bidder 87, $620; 122, $490.

Class 8. One automatic knife grinder—Bidder 82, $490; 87, $433.90; 122, $710.

Class 9. One portable bench grinder—Bidder 35, $68; 87, $66 and $83.

Class 10. One sensitive drill—Bidder 35, $112; 87, $107.

Class 11. One open side planer—Bidder 87, $4080; 122, $3250.

Class 12. One crank shaper—Bidder 87, $1128; 122, $1350; 134, $1497; 158, $1195.

Class 13. One chain saw mortising machine—Bidder 87, $1830.

Class 14. One single bolt cutter—Bidder 27, $550; 81, $575; 87, $544; 122, $505 and $510.

Class 16. One universal woodworker—Bidder 27, $1495.91; 81, $1700; 87, $1436.

Schedule No. 8.

Class 21. One belt driven shaper—Bidder 65, $480; 122, $520; 124, $949; 158, $399.

Schedule No. 9.

Class 31. One Fairbanks motor driven hammer—Bidder 65, $650; 122, $735.

Class 32. One manufacturer's type drill—Bidder 65, $350; 122, $335.

Class 33. One motor driven engine lathe—Bidder 65, $875; 88, $935; 158, $710.

Schedule No. 10.

Class 41. One universal milling machine—Bidder 10, $1900; 134, $1795; 151, $2044.

Class 42. One vertical drilling machine—Bidder 122, $80 and $82; 134, $73; 151, $69.

Class 43. One universal radial drilling machine—Bidder 122, $1830; 134, $1738; 151, $1875.

Class 44. One horizontal boring and drilling machine—Bidder 106, $3220; 122, $3355; 134, $2820; 151, $2650.

Class 45. One vertical boring and turning mill—Bidder 122, $2775; 134, $2625; 151, $2425.

Class 46. One single frame steam hammer—Bidder 56, $1113 and $1178; 81, $1024; 122, $1070; 134, $1070; 151, $1050.

Class 47. One pipe cutting and threading machine—Bidder 49, $685; 63, $510; 81, $765; 122, $665; 134, $498; 151, $480; 158, $410; 162, $550.

Class 48. One engine lathe—Bidder 72, $3150; 134, $4248; 151, $4895.

Class 49. One engine lathe—Bidder 72, $1440; 88, $1800; 134, $1792 and $1656; 151, $2078; 158, $1395.

Class 50. One double angle shearing machine—Bidder 29, $5275; 122, $6050; 134, $2405.

Class 51. One slotting machine—Bidder 122, $3025; 158, $2225.

Schedule No. 11.

Class 61. Two marine straight water tube boilers and spare parts—Bidder 15, $11,850; 112, $14,976.

Schedule No. 12.

Class 71. One shunt wound electric motor—Bidder 45, $266.20; 68, $281; 177, $298; 195, $235.

Schedule No. 14.

Class 103. Four hydraulic jacks—Bidder 9, $174; 41, $164.52; 51, $163.40; 67, $184; 81, $147.95; 122, $155; 157, $140.47; 174, $157.65; 178, $155.45; 201, $206.

Class 105. One valve reseating machine—Bidder 9, $325; 12, $325; 49, $325; 51, $325; 67, $325; 74, $325; 81, $325; 122, $325; 157, $325; 174, $330; 178, $325.

Schedule No. 30.

Class 191. One No. 1 Newton combination cold saw cutting-off machine—Bidder 133, $976.

The following bids were opened July 21 for machinery for the Isthmian Canal Commission:

Bidder 2, Bradford Machine Tool Company, Cincinnati, Ohio; 10, Fairbanks Company, New York; 11, Handlan-Buck Mfg. Company, St. Louis, Mo.; 13, Manning, Maxwell & Moore, New York; 14, Motley, Green & Co., New York; 15, Niles-Bement-Pond Company, New York; 16, C. T. Patterson Company, New Orleans, La.; 20, Hallidie Machinery Company, Seattle, Wash.; 21, Prentiss Tool & Supply Company, New York.

Class 2. One engine lathe—Bidder 2, $2410; 10, $2330; 11, $2600; 13, $2498; 14, $2143.50; 15, $3226 and $2906; 16, $2475; 20, $2716; 21, $2940.

Class 3. Two pillar crank shapers—Bidder 10, item 11, $375 and $475, item 12, $585; 11, $1140; 13, $1112; 14, $839.55; 15, $1151; 16, $930; 20, $1104; 21, $1248.

The following bids were opened July 21 for equipment for the central power station of the Charleston, S. C., Navy Yard:

E. Rutzler Company, New York, item 1, $112,514; 2, $108,985; 5, $103,159; 6, $95,000; 7, $85,644; 8, $100,973; 9, $91,470; 10, $83,458.

Evans, Almirall & Co., New York, item 1, $114,400; 2, $110,800; 3, $113,200; 4, $110,260; 5, $107,300; 6, $99,600; 7, $92,500; 8, $101,350; 9, $96,000; 10, $86,500.

The Scofield Company, Philadelphia, Pa., item 1, $135,524 and $141,171; 2, $5900, deduct, and $7975, deduct; 3, $1375, deduct; 4, $500, deduct; 5, $12,812, deduct, and $14,812, deduct; 6, $15,306, deduct; 7, $15,306, deduct; 8, $11,479, deduct, and $12,812; 9, $15,306.

Ricketts Engineering Company, Washington, D. C., item 1, $104,726; 2, $97,999; 3, $4905, deduct; $1406, deduct; $164, deduct; $4471, deduct; $400, deduct, and $1130, deduct; 4, $164, deduct; $4471, deduct; $400, deduct; $1130, deduct; $3058, deduct, and $1406, deduct; 5, $92,399; $5500, deduct; $3907, deduct; $640, deduct; $500, deduct, and $800, deduct; 6, $18,900, deduct; 7, $18,900; 8, $87,421; $2529, deduct; $2114, deduct; $640, deduct; $500, deduct, and $800, deduct; 10, $18,900.

Jeffrey Mfg. Company, Columbus, Ohio, $19,243.96, coal handling apparatus only.

Link-Belt Engineering Company, Nicetown, Philadelphia, Pa., $13,915, coal handling apparatus.

Underfeed Stoker Company, Chicago, Ill., $6357, for stokers only.

Exeter Machine Works, New York, $15,900, coal handling apparatus only.

Generating Sets.

General Electric Company, Schenectady, N. Y., item 1, $72,870.

McIntosh, Seymour & Co., New York, item 2, $89,800; 6, $65,800.

Westinghouse Electric & Mfg. Company, Baltimore, Md., item 1, $73,997; 2, $88,495; 5, $57,995; 6, $66,675.

Allis-Chalmers Company, Milwaukee, Wis., item 2, $106,525; 6, $83,512.

Compressors.

Ingersoll-Rand Company, New York, item 1, $25,500; 2, $25,500; 3, $21,479; 4, $21,479.

Joseph L. Sweigard & Co., Philadelphia, Pa., item 1, $31,769; 2, $32,259; 3, $28,356; 4, $28,656.

Under bids opened June 8, circular No. 310, for class 92, electric light for the Isthmian Canal Commission, the D'Olier Engineering Company, Philadelphia, Pa., was awarded item 250, $3052; Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., item 251, $1554; General Electric Company, Schenectady, N. Y., item 252, $487.

Under bids opened July 16, circular No. 315, for machinery for the Isthmian Canal Commission, Handlan-Buck Mfg. Company, St. Louis, Mo., was awarded class 1, two vertical boring machines, $1150; Manning, Maxwell & Moore, New York, class 2, one car ripping saw, $474.

The following awards have been made for machinery for the Isthmian Canal Commission, under bids opened July 17, circular No. 316:

Niles-Bement-Pond Company, New York, class 1, one iron planer, $2152; class 4, one iron shaper, $462; class 6, one single punching and shearing machine, $1847.

Manning, Maxwell & Moore, New York, class 2, one upright drill, $110.50; class 3, one vertical boring and turning mill, $3175; class 5, one pipe threading machine, $900.

Trade Publications.

Welding Plates.—Phillips-Laffitte Company, Pennsylvania Building, Philadelphia, Pa. Pamphlet. Briefly calls attention to the uses of Laffitte welding plates for inserting between the contact surfaces of iron and steel parts which are to be welded. The chemical action of the plate is claimed to increase the strength of the weld and enables it to be made at a lower temperature with a saving of time and fuel. The plates are made in 4 x 8 in. size, and of two weights, one for heavy work and one for light work such as spring steel, small angles, &c. One plate is sufficient to make from 6 to 100 welds. The pamphlet also refers to Laffitte welding powder, tempering powder and brazing plates and powder.

Economizers.—B. F. Sturtevant Company, Boston, Mass. Bulletin No. 132. Illustrates and describes Sturtevant economizer installations in the power houses of the Interborough Rapid Transit Company, the New Orleans Railway Company, the Boston Elevated Railway Company, the South Covington & Cincinnati Street Railway Company, and the Burlington Municipal Electric Lighting Company. The Interborough installation includes 28 economizers, sufficient for 26,000 h.p. of boilers. Those in the New Orleans plant operate under the unusually high pressure of 225 to 250 pounds per square inch. The Boston Elevated Railway Company, after deciding to remove three of its economizers and put in new ones which should include features designed by its own engineers, found that the Sturtevant type embodied practically all of the suggested improvements. As a result these economizers were purchased.

Plant Construction.—Miller-Collins Company, 29 Broadway, New York. Circular showing some current work of this firm of engineers, this being the new plant for the Lidgerwood Mfg. Company at Waverly, N. J. Photos show perspective plan and perspective sketch of the complete work, and photographic views of the site at various stages of the building.

Compressed Air Pumping.—Ingersoll-Rand Company, 11 Broadway, New York. Pamphlet 74-A. Points out the economies of pumping by compressed air, referring particularly to the air lift pump, its cost and advantages, the return air system with its advantages and operation, and the Latta & Martin pneumatic displacement pump, which was described in *The Iron Age* May 3, 1906.

Thermit.—The Goldschmidt Thermit Company, 43 Exchange place, New York City. Pamphlet. Contains instructions for welding wrought iron and steel pipes by utilizing the heat of the thermit reaction. It concerns an improved method for this work, as instead of sheet iron molds, which have heretofore been used for that purpose, there have now been substituted cast iron molds, which considerably simplify the manipulation. The com-

pany carries molds in stock for the various sized standard wrought iron pipes. This application of the process has found considerable use in the welding of ammonia pipe lines on the street, as the welding can be done anywhere in position.

Steam Hydraulic Elevators.—Craig Ridgway & Son Company, Coatesville, Pa. Circular. Describes the operation of the steam hydraulic, a piece of apparatus for producing by the direct use of steam the hydraulic pressure necessary for operating elevators. Steam is admitted to the top of the cylinder and exerts the pressure on the water through the medium of a layer of air which prevents the condensation of the steam, such as would follow contact with water. Several applications of the apparatus to factory elevators are shown.

Blowers, Engines, Motors, Economizers, &c.—B. F. Sturtevant Company, Boston, Mass. Condensed catalogue No. 135. This is one of the most comprehensive publications ever issued by this company, and covers the great variety of its products, including blowers, engines, motors, generating sets, economizers, steam heating apparatus, forges, exhaust heads, &c. Nearly half of the catalogue is devoted to the varieties of blowers made, including high pressure blowers capable of creating pressures up to 10 pounds per square inch, steel pressure blowers with pressures up to 16 ounces per square inch, monogram fans operating up to 5 ounces per square inch, steel plate fans with a still less limit of pressure, and disk and propeller fans which seldom operate at pressures above 1 ounce per square inch. Engines, motors, generators and generating sets occupy a larger proportion of space than in any previous catalogue. No less than 80 sizes of engines, 42 standard motors and 26 sizes of generating sets are illustrated and listed. Forges in a list of 38 sizes, exhaust heads, steam traps and the like find a place in these pages, while heating, ventilating, drying and mechanical apparatus in well-known types is briefly described. New features in the line of Sturtevant products, such as economizers and pneumatic separating systems, are also shown.

Steam Trap.—Thorpe, Platt & Co. (manufacturers); Fairbanks Company (selling agent), New York City. Circular No. 401. Gives a brief description of the Geipel steam trap, with table of dimensions and capacities and instructions for working.

Electrical Apparatus.—The Elm City Engineering Company, New Haven, Conn. Circulars. The first concerns the Hoyt & Martin electric metal separators, made in two sizes, to be used with direct current, their purpose being to separate iron and steel from nonmagnetic metals or other materials. The other circular describes the H. & M. molding branch blocks, which are claimed to form a convenient and safe means of making branch connections in electrical wiring where it is placed in wooden molding. The blocks do away with splicing, soldering and taping.

Gasoline Engines.—Trebert Gas Engine Company, 163 Main street, Rochester, N. Y. Two catalogues. One shows a line of automobile engines, including a four-cylinder 35-hp. motor, a four-cylinder 25-hp. motor, a 16-hp. four-cylinder air-cooled motor, a two-cylinder 10-hp. motor, a two-cylinder 15-hp. opposed motor, and also shows a double chain-drive transmission gear, and a direct-drive transmission gear and details of an expansion clutch. The air-cooled engine shown in this catalogue is a new product. The other catalogue applies to marine engines and shows the following: A two-cylinder 10-hp., a four-cylinder 35-hp. and a four-cylinder 25-hp. motor, and two-blade reversible propeller wheels, solid propeller wheels, independent reversible friction clutches, couplings, crank shafts, &c. The 25 and 35-hp. marine engines are both new products.

Cranes.—Whiting Foundry Equipment Company, Harvey (Chicago), Ill. Catalogue No. 45. 162 pages. Illustrated. To be placed in sectional catalogue binder. Contains a description of electric travelers and cranes of all types; 100 illustrations of late crane installations in foundries, machine shops, railroad shops, power houses, steel plants, &c., including, besides electric travelers and hand power cranes, numerous jib and bracket cranes, pillar cranes, gantry cranes, transfer cranes, electric transfer tables, special derricks for railroad and marine service, &c. Includes a list of users of Whiting electric traveling cranes from heaviest to lowest capacities.

Presses.—Boomer & Boschert Press Company, Syracuse, N. Y. Two catalogues. The thirty-second annual catalogue, pertaining to food, wine and other presses, is 6 x 9 in. in size and contains 118 pages. The various presses shown may be classified according to the power employed, as screw, hydraulic and knuckle joint. There are several sizes of each kind, and platforms are adapted to all situations, the company being prepared to furnish outfits for any size mill from the smallest to the largest. The other catalogue contains a more varied line, covering lard oil, scrap, fertilizer, leather, leather belting, veneer and baling presses of all kinds, paper presses, &c. The latter part of the catalogue contains a section on pumps for operating hydraulic presses.

Air Compressors.—Ingersoll-Rand Company, 11 Broadway, New York City. Catalogue R 10 A. Devoted to the Imperial type X air compressors. A general description of the type is given, followed by an explanation of the various forms in which it is built, that is, with duplex or compound air ends, steam, belt or gear drive; alternatives in the steam valve furnished, Corliss or Meyer, &c. Numerous illustrations are given.

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HARDWARE

WITH the development of the retail organization movement among Hardware merchants a development which has been so signally successful during the past few years, there have naturally come changes in the character of the annual meetings of the associations. The whole movement is indeed a notable and novel one, for which it is difficult to find a parallel. The Hardware trade may indeed congratulate itself on being the best organized of any branch of business. This probably indicates not that Hardware merchants are chief sufferers from trade evils, but rather is an evidence and result of the intelligence which characterizes its merchants, and the practical manner in which from their training they take hold of the problems which confront them, and adapt themselves and their methods to the constantly changing conditions under which they conduct business. It certainly indicates breadth of mind, as well as the genial spirit of comradeship and fraternity which prevails among them.

One of the chief tendencies in connection with the annual retail association meetings is the providing for exhibits by manufacturers, who are thus given opportunity to bring to the attention of the trade the goods they are selling and particularly any specialties on the introduction or disposal of which they lay emphasis. From advices which we have in regard to the coming meetings of the State associations it is evident that this feature will be more prominent than ever with many of them. Specially elaborate arrangements are being made in some States and the exposition feature will be an exceedingly important one. Without attempting to review in detail the advantages and disadvantages of this practice it is obvious that it should have as one of its results a coming into closer relationship of the manufacturers and the retail merchants, and should thus tend to accentuate the movement in this direction which is so noticeable a characteristic of the trade. At the same time it brings up to manufacturers some difficult problems especially in regard to their representation at such gatherings, a matter which involves not a little labor and expense. To what extent representation is to be made and the manner in which the exhibit is to be conducted are questions which each manufacturer will have to settle for himself. The value and fruitfulness of this method of publicity remains to be ascertained.

Some time since we referred to the aggressive campaign determined on by the Inland Empire Hardware and Implement Association for the eradication of the peddlers of Ranges and Vehicles from the territory covered by the association. A large fund was subscribed to be used in following up the peddlers wherever they made their appearance and making it plain to farmers and ranchers that the local merchant was quite able to sell as cheap and in most instances cheaper. So effectively was this done at the outset that we understand that the peddlers found the going very heavy, and were able to dispose of but few goods. This led one of the manufacturers whose product was thus brought to the attention of the public to apply for an injunction restraining the association and its representatives from "preceding or following in such a manner as to hinder, obstruct, harass, annoy or intimidate" the peddlers of the complainant's goods. The injunction was granted, and arguments on the question of making it permanent will be heard some time this month. An important question as to the lines on which associated merchants can legitimately work in the advancements of their interests and in opposition to the efforts of distasteful competition will thus receive, it is presumed, judicial elucidation.

Condition of Trade.

Midsummer has passed without bringing to the Hardware trade its wonted period of relaxation. Indeed, the vacation season has been an exceptionally trying one to many who, with a volume of business remarkably sustained, have been obliged to carry an added load in the absence of those whose co-operation and assistance they usually enjoy. A little more, indeed, of the accustomed let-down would not have been entirely unwelcome in the present short handed season. Possibly some slackening of pace has been observed in the last two weeks, but a renewal of activity is already apparent before there has been an opportunity to enjoy the usual summer quiet preparatory to the fall campaign. Manufacturers also have found conditions somewhat trying, few having been able to catch up with their orders as they hoped to do. Factories and storehouses show much less than the usual accumulation of goods against the coming demand. That such demand will be large can hardly be doubted in the face of the conditions of unexampled prosperity surrounding our merchants in nearly every section of the country. Full yields in nearly all our staple crops are now practically assured, and activity is observed in many forms of enterprise dependent on a successful agricultural season. In the face of such conditions, prices of Hardware commodities have naturally remained firm, but the market has also been characterized by great stability and steadiness, begetting confidence among distributers and with large consumers as well. It may fairly be assumed that early orders will be liberal, not only in recognition of the present reasonable range of prices, but in anticipation of probable difficulty in securing prompt execution of belated purchases.

Chicago.

While the Hardware trade during July showed a slight falling off as compared with June, the volume of business transacted by Western distributors established a new high record for the initial month of the second half of the year, and the outlook for the fall trade is unusually bright. The absence of noteworthy price changes has steadied the market to an unusual degree, and both merchants and jobbers are satisfied with the existing values and are freely covering their future needs. Compared with raw material costs, especially in the iron and steel lines, prices are on a lower basis than a year ago, and the advances on commodities governed by the metal market are only commensurate with the sharp upward movements that occurred earlier in the year. That collections have only been slightly affected by the tight money market in the East is indicative of the great agricultural wealth of this section, and record crops insure a continuation of this prosperous condition. On account of the curtailment of the production of Wire products during July it is already feared that a shortage will confront the mills during the fall months. Wire Nail makers reduced their output to steady prices, while the Rod mills were unable to meet the requirements of their finishing plants on account of the Steel shortage.

If the heavy buying for future needs that characterized last month reflects fall trade conditions there will not be sufficient material to meet the demands, and to provide stocks a general resumption of idle capacity occurred this week. The shortage of Wagon Hardware is acute, and it is almost impossible to secure Clevises, as the malleable foundries are engaged in the manufacture of large and more profitable work. The resumption of the implement plants throughout this territory has created an early demand for all lines of Heavy Hardware, and shipments from jobbers' stocks are more frequent than heretofore, on account of the slow deliveries of manufacturers. Filling in orders for seasonable goods that moved several months ago are heavy, and the buying of Shelf Hardware to replenish depleted stocks has already set in. Considerable interest is manifested in the Wire Cloth schedule, which will be announced shortly, and on account of the unsatisfactory conditions of the trade during the past season most of the jobbers favor a higher basis than has been prevailing.

St. Louis.

NORVELL-SHAPLEIGH HARDWARE COMPANY.—Fall business is getting under full headway. Closing Saturday afternoons is now a thing of the past. Crop conditions are almost ideal. The last Government crop report from the Department of Agriculture shows the average of both corn and wheat better than last year and better than the 10-year average. There must be something radically wrong with the house or the salesman who cannot obtain a reasonable share of business under present conditions.

There are dangers of adversity and there are also dangers of prosperity. We now fear only the dangers from too much business and too much enthusiasm. Overexpansion is the rock upon which many split in prosperous times. When business is good merchants became careless about the expense account, they increase their fixed expenses without careful thought. There is a vast difference between adding to the burdens of a business a fixed charge and a temporary expense which can be promptly eliminated.

In good times merchants also become careless in their buying. They buy the wrong kinds of goods, they buy too many goods, they tie up their capital in goods that do not move rapidly. It is more often in good times that the enthusiastic and uncontrolled buyer is most dangerous.

We have always been of the opinion that the character and quantity of goods bought are of more importance than the price. Prices to a certain extent are controlled, there is no great variation after all, but there is no limit to the harm that can be done by reckless salesmen selling goods to overly optimistic buyers. In the writer's experience he has seen more crimes committed by salesmen in the quantity and assortment of goods sold than by overcharges in prices. As prices are in a measure made at home salesmen do not usually wander far astray in their selling prices, but there naturally can be no control from headquarters over the kind and quantity of goods sold. In almost every instance where jobbers are called to officiate at the wake of some defunct retail business, when the stock is invoiced it is found the unfortunate merchant, on account of overbuying on poor selling lines, was doing his business on practically one-half his capital, the rest of his investment being tied up in dead and unsalable goods.

Unless our experience in past good years is of no value now many retail merchants will suffer in time to come for their extravagant buying this fall. This class of buying should not be encouraged by the jobbers. All of us will surely have enough business under present conditions. Will it not be wise on the part of jobbers to do our best to keep our customers from overloading? Their payments will certainly be better and they will be in a more healthy condition financially for business next spring.

The special salesman in times like these has his killing. The enthusiastic merchant in order to get the "extra 5" will buy goods from the special in gross lots, of which his records may show (if he will stop to think) he has not sold more than a few dozen in the past 12 months.

In these times the retail merchant who has been buying his goods from the jobber in moderate quantities just as he needed them is encouraged to make manufacturing connections. He will buy in case lots where he formerly bought by the dozen. He will feel honored at the manufacturer's visit, and he will be ashamed to offer this manufacturer's salesman the same homeopathic quantities he has been giving the jobber. He will forget that manufacturers are not accustomed to filling orders as promptly as jobbers. While the demand is upon him he will wait for his goods, and he will have no recourse when they arrive, probably after the season is over.

In our humble opinion the principal danger to the Hardware trade this fall is a saturnalia of buying, to be followed the next morning with the usual headache and the application of iced towels. While of course there may be shortages here and there this fall we have no doubt jobbers have prepared for the fall business, and that a dealer can count upon 99 items out of 100 being filled on his orders and being shipped within a few days from his jobbing friends. Then we must not forget there are many jobbers, and if one jobber happens to run short of certain items retail dealers can call on another; they have more than one string to their bow.

Therefore we modestly recommend to our friends and customers in the trade that they purchase goods for the fall business with confidence, but in a reasonable manner, and that they be not carried away by their enthusiasm on account of the good times.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The general vacation period is now upon us and presents a problem to all persons largely engaged in trade, either manufacturing or jobbing, which it is very difficult to solve. We all realize the fact that each employee would have a vacation for rest and preparing for fall and winter work, but it is impossible to engage persons to fill their positions temporarily, consequently with the activity in trade that there is this year extra work is entailed for those remaining at home and considerable anxiety to the heads of establishments.

Trade for the first half of 1906, it has recently been stated by statisticians, was the largest for the first six months of any year, and trade since July 1 has been remarkably good for midsummer. There has been great encouragement in the agricultural districts from the fact that the weather as a whole has been favorable to crops over the entire country, and with the present condition the green crops throughout the country are looked upon as a record breaker. We are also glad to report that the condition of the cotton crop throughout the South from present appearances seems eminently satisfactory. It is possible that the export trade on agricultural products will be less than in former years from the fact that our increased population each year demands more of our products for home consumption and the advances of wages throughout the country of various employees possibly causes a little extravagance.

The foreign commerce of our country for the fiscal year ended July 1 will be found to be greater than any previous year, at least as far as the last ten years back. Money in our banks both in this city and New York is being used to the utmost possibility of banks. This may be misunderstood by many persons from the fact that the Government bonds recently offered brought such a high premium, which is not owing to the fact that banks have money to spare, but largely to because a certain amount of this money is left with the banks without interest to January 1.

Some manufacturers are getting behind orders, and especially is this the case with Locks, Latches and Knobs. The wonderful increase of building throughout the country is stated to be unprecedented in our history. The changes that have taken place in the prices of Hardware recently seem to be, as stated by manufacturers, actually necessary on account of the increased cost of material used in the product.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The market conditions still favor the seller. Large purchases for construction of boats on lakes and locomotives, cars and warehouses on land are using up material faster than the furnaces and mills can turn it out. Every item on the list may be called strong.

The main fear now of large purchases is they will not line up to their agreements in either quantities or time of delivery. Prospects are universally fine, and the purchasing power of the country is still on the increase. There is a good demand for money, which is bringing full rates, but that is only another sign of prosperity and not to be grieved over.

The summer vacation season is on, which is always one to be struggled with in the stores and offices. In the course of time it is hoped that we shall be able to adapt matters to conditions, so that the days when picnics and cheap excursions are in vogue customers will go easy with their orders and moderate their demands for shipment by first freight sure.

If Stonewall Jackson arranged his correspondence, as his biographers claim, so that none of his letters should travel on Sunday, possibly retail buyers will be equally considerate and contrive that there shall be no rush mail orders after Saturday high noon. If the New Zealand plan of six hours per day prevails in the far future, further readjustments will, of course, be in order, but that we leave to future generations, along with a few other questions of similar nature.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—There is practically no change since our last report, except that as the season advances the volume of business increases. The prospects for a fine crop remain unchanged. Farmers have every assurance of a good price for their products, and with the immense crop, which is almost assured, we can safely say that the prospects for business were never better.

It seems now to be a question of whether or not the manufacturers can supply the demand for their goods. The immense crop is creating a demand, which has never been experienced at this season in any previous year. We think this is a time when the jobber and retailer alike should look over their stocks carefully and see if they are prepared to handle the great business which is certainly going to be had this fall. The bankers of the South are all figuring carefully on their resources to see if they will have money enough to handle the growing crops which bid fair to be the greatest both in volume and cash value that have ever been produced. Collections are about as usual at this season of the year.

Cleveland.

THE W. BINGHAM COMPANY.—It is truly remarkable what a self-sustaining country we live in. We have such a great variety of climate and soil that if one section fails in crops another section has an abundance. Right in our immediate vicinity the peach and grape crop this year will be very fair, but carloads upon carloads are being shipped in here and to other States from Georgia and other Southern States. Same is also true of other fruits. Surely we are prosperous in all our borders, and we ought to be extremely thankful that our lot is cast in such a pleasant, prosperous and splendid country.

Not only in this vicinity but throughout Ohio farmers are getting in their hay crop; next comes their oats, corn and potatoes, which bid fair to be a bountiful supply. The great growing West gives promise of an immense wheat and corn crop. It is a well-known fact that when the farmer has good crops money is plenty and we have prosperous times.

Trade in building material of all kinds is excellent. Although there have been advances in prices of many goods by the manufacturers the jobbers have not yet exacted these advances from their customers, hence there is a large business in all kinds of Hardware, Mining, Milling and Manufacturing Supplies. There is still a shortage of some goods all over the country, although Cleveland's five jobbing houses carry the largest variety of Hardware of any other city in the world, and are still adding to their lines. The jobbers here confine themselves strictly to the Hardware business. They do not handle clocks, watches, glassware, jewelry, &c. We believe in confining our business to legitimate lines of goods and give the other fellow in these lines a chance, as in that way we can carry a greater variety and larger stocks of General Hardware, Mining, Milling and Manufacturing Supplies, and not interfere with other tradesmen, but "saw wood" and stick to our own "knitting."

Salesmen are returning from their vacations, and the size of orders they are sending in indicates that merchants' stocks are light, and we anticipate an excellent fall trade.

Some changes in prices have taken place since July 1. Plain, Retinned and Stamped Tinware, also Enameled Ware, have advanced 10 per cent. Carpenters' Chalk has advanced since January 1 50 per cent., and now another 10 per cent. is announced. Tinned Picture Wire is up 20 per cent., and Augers and Auger Bits 10 per cent. So don't be afraid to buy shelf goods of your jobber, who will be only too glad to help you out.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—August opens with very satisfactory conditions. The weather has been unusually favorable for all crops, as well as seasonable for farm work. Haying has been making good progress, and notwithstanding the hay crop in the lowlands has been shortened by the wet spring, there will still be a very fair hay crop, the upland being fine. Corn has lately made substantial progress, but it is still not up to average.

We are now just at the beginning of the harvest of small grain. Rye is cut and barley harvest is in progress. The cutting of oats has begun on the southern territory, and the wheat harvest will open in a week. There is a fine wheat crop in prospect, and it is now so far advanced that probably the only danger is from hail and possibly from unfavorable harvest weather. The former contingency may affect local conditions, but will have but little general effect. We usually have favorable harvest weather, and trust that this year may be classed in this respect with the rule and not as an exception.

If present conditions are fairly well realized, the Northwest will have an active fall business, and will be in excellent financial shape. The volume of business is large, prices are steady and collections are good.

Portland, Oregon.

FAILING, HAINES & MCCALMAN.—Business could not be better here than it is. Everybody is busy working up to full capacity. There are no signs of a summer lull as yet. Collections are very good for this season of the year. A very large proportion of dealers are discounting their bills. Crops all promise well, except in a small section, where there is about half a crop.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The months of July and August are seldom marked by any special activity in jobbing circles. The volume of business, however, still continues very satisfactory. The harvest of small grains just completed showed a heavy yield and of excellent quality. The weather continues propitious for the ripening corn, and every indication points to a large crop. Industrial and commercial activity is well maintained, and the general outlook is essentially favorable.

The Hardware market is comparatively featureless, and as most lines appear to occupy a fairly firm position it is more than likely that values, as a rule, will maintain the *statu quo* for the remainder of the year.

NOTES ON PRICES.

Wire Nails.—For the month of July the tonnage placed with the mills was very gratifying, being in fact in excess of the same month for any previous year. The outlook for a large fall demand seems assured. The

continued shortage of steel is reported as restricting the output of Nails to some extent. While concessions of 5 cents per keg on carloads and larger lots are sometimes made the market is steady and firm. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.85
Carload lots to retail merchants	1 90

New York.—The local demand is quiet, as demand is confined to immediate requirements, which are seasonably light. Quotations for small lots from store are on the basis of $2.10 per keg.

Chicago.—New tonnage of all kinds of Wire products closed by the leading interests during the past month greatly exceeded all previous July totals, and this unprecedented midsummer buying is considered indicative of a record fall consumption. Distributers already report an improvement in the demand for Wire Nails and merchant stocks are very low. Mill stocks of certain sizes are also depleted, and a general resumption of idle plants has occurred this week to provide for the fall trade. Concessions have been almost entirely withdrawn, and the market is in an exceedingly strong condition, the season considered. Quotations are firm and unchanged, as follows: $2 in car lots to jobbers and $2.05 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—Stocks of Wire Nails in the hands of jobbers and retailers are reported to be very light and may result in a shortage in supply when fall trade starts, which will be early in September. The Wire Nail mills continue to report a shortage in supply of steel, which is restricting output to some extent. Tonnage in Wire Nails placed in July was a record breaker, greatly surpassing all previous records for that month. It is intimated that very early in the fall there will be an advance made in prices of Wire Nails, but this is not officially confirmed. The tone of the market is firm, but concessions of 5 cents a keg on official prices continue to be made on large orders. Official prices, which are shaded to this extent on desirable orders, are as follows: Wire Nails, $1.85 in carloads to the large jobbing trade and $1.90 in carloads to retail merchants, f.o.b. Pittsburgh, plus actual freight to point of delivery, terms 60 days, less 2 per cent. off for cash in 10 days.

Cut Nails.—The Cut Nail Association at last week's meeting continued quotations. A slight improvement in new business is reported, but the mills are more largely employed in filling specifications on contract orders. Concessions on official prices of 5 cents per keg, f.o.b. Pittsburgh, are understood to be more or less general. Official quotations are as follows: $1.80, base, for carload lots, f.o.b. Pittsburgh; $1.85 for less than carloads, f.o.b., Pittsburgh; $1.95 for carload lots, on dock, New York; $2 for less than carloads, on dock, New York. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

New York.—The demand is light, which is not unusual at this season. Quotations for small lots from store are on the basis of $2 per keg.

Chicago.—With a view of maintaining quotations which were reaffirmed at the meeting of the Cut Nail Association last week, the manufacturers decided to curtail their output during the present month. Demand is seasonably light, and owing to the low prices that have recently been made to secure tonnage, makers have been operating at a loss, on account of the high costs of raw material. The following quotations were reaffirmed: Steel Cut Nails in car lots, $1.90 to $1.95; less than car lots, $2; Iron Cut Nails, $2 to $2.05 in car lots; less than car lots, $2.10.

Pittsburgh.—No change in prices of Cut Nails was made at the meeting of the Cut Nail Association held on July 25. Reports showed the Cut Nail trade to be in satisfactory condition, demand being larger than usual for this season of the year, and stocks in the hands of jobbers and retailers very light. Specifications on contracts continue to come in quite freely and the mills are fairly busy. We quote Cut Nails at $1.75, base, f.o.b. Pittsburgh, for carload lots, and $1.80 in less than carload lots. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 5 to 10 cents advance on Steel Cut Nails.

Chicago.—Purchases continue to be made by large jobbers for their future requirements and occasional concessions of 5 cents per 100 lbs. on large orders are reported. Specifications from the distributing trade are light, although the railroads are using a large amount of material in making extensions. Quotations are unchanged as follows: To jobbers, $1.85, f.o.b. Chicago, in car lots, and car lots to retailers, $1.90.

Pittsburgh.—Contracts are now being made by the large trade for fall shipment, and the railroads continue to buy quite freely. The market is fairly strong, but in some cases prices are shaded 5 cents per 100 lbs. on desirable orders. Official quotations, which are sometimes shaded to this extent, are as follows: Painted Barb Wire, $2, and Galvanized, $2.30, in carload lots to the large jobbing trade, with the usual advance of $1 a ton to retailers in carload lots f.o.b. Pittsburgh, 60 days, or 2 per cent. off for cash in 10 days.

Barb Wire.—The large trade is now placing contract orders for fall shipment. The railroads are still using a large amount of Barb Wire along their lines. In some cases concessions on carload and larger lots of 5 cents per 100 lbs. are made. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in ten days:

	Painted.	Gal.
Jobbers, carload lots	$2.00	$2.30
Retailers, carload lots	2.05	2.35
Retailers, less than carload lots	2.15	2.45

Smooth Fence Wire.—Demand from various sources has been exceptionally heavy during July, being much in excess of the same period of last year. Specifications on contracts are being received by the mills, and fence manufacturers are placing large orders for fall delivery. The shortage in the supply of Steel is restricting the output of the mills, which are behind on their orders. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base.	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago.—The consumption of Smooth Wire for general manufacturing purposes is unprecedently heavy, and the mills are from two to four weeks behind on deliveries. Fence manufacturers continue to contract for their future needs, and a large tonnage has already been booked by the leading Wire interests. Plants of Fence makers are beginning to resume operations on stocks for the fall trade, and the bright crop outlook augurs well for a heavy consumption. Prices are well maintained, as follows: To jobbers, Chicago, car lots, Painted, $2.15; Galvanized, $2.45. To retailers, car lots, Painted, $2.20; Galvanized, $2.50. Retailers, less than car lots, Painted, $2.30; Galvanized, $2.60; Staples, Bright, in car lots to jobbers, $2.10; Galvanized, $2.40; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The mills are receiving liberal specifications on contracts, while the Fence manufacturers continue to place larger orders for fall delivery than they gave out last year. Tonnage in Fence Wire placed in July is said to have been more than twice as large as in the same month last year. The output of the mills is very much restricted by the continued shortage in supply of Steel, which gives no promise of being relieved in the near future. Prices are quite firm, but are occasionally shaded 5 cents per 100 lbs. on desirable orders. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.70
Retailers, carloads	1.75

The above prices are for base numbers, 6 to 9.

Seamless Brass Tubes.—Under date of July 18, manufacturers revised the list prices on Seamless Brass Tubes by the elimination of the smaller gauges and sizes, including gauges 17 to 25 and 3-16, ¼ and 5-16 in. sizes. When orders are received for the above gauges and sizes manufacturers are at liberty to accept them at such prices as they see fit, which would presumably be lower than under the former methods of adding the regular extras to the base price. It is understood that competition on these gauges and sizes has been in evidence, as manufacturers who make these small gauges and sizes only have sold them for less than the regular prices recently in force.

Tin and Galvanized Ware.—Prices of Stamped, Pieced, Japanned and Galvanized Ware have again been advanced by many of the leading manufacturers, the change averaging about 5 per cent. on the general line. On some goods the advance may be a little less or a little more than this, and a few articles, notably Galvanized Pails and Tubs, have not been changed at all. It is stated that there will be a general rearrangement of prices to make them fit present conditions of the market for raw material, &c., and a new low list will probably be adopted. It will be remembered that the manufacturers made an advance on these lines a few weeks ago, and this further rise in prices is taken to indicate more or less harmony of action among the larger producers.

List Prices on Brass Goods.—We are advised that the Brass manufacturers of the United States, in accordance with their custom and their understanding with the various trades and supply associations will on the first of the year make whatever alterations, corrections or additions to their lists as may seem desirable. To this end suggestions are invited from the manufacturers or the trade, which may be sent to Wm. M. Webster, 1110-1112 Schiller Building, Chicago, that they may be placed in the hands of the List Committee, which meets early in September.

Magnolia Metal Company.—Magnolia Metal Company, 113-115 Bank street, New York, is manufacturing a variety of Antifriction and Babbitt Metals to cover practically all the requirements in this line of manufacturers and the trade. The company's prices to consumers on their regular and most widely used lines are as follows, in quantities of less than 5 cwt.:

Magnolia Metal	25c.
Defender Metal	18c.
Mystic Metal	16c.
Cosmic Metal	13c.

Rope.—Manufacturers express themselves as satisfied with demand, which they characterize as fair and seasonable. Prices are unchanged. Quotations are as follows: Pure Manila, 12½ cents; B quality, 11½ cents; Pure Sisal, 9 cents; No. 2 quality, 7¾ cents per pound.

Window Glass.—The Mountain Window Glass Company is a syndicate of the mountain factories in Pennsylvania, recently incorporated under the laws of New Jersey with $100,000 capital, for the sale of the Glass they manufacture, with headquarters at Kane, Pa. It is anticipated by those interested in the project that the company will control the output of about 1000-pot capacity. The settlement of the wage question by the manufacturers and the Amalgamated Association of workmen will probably be the next important matter to be decided, as it will affect the price of Glass during the coming fire. As there were not enough skilled workmen to fill all the places in the factories during the 1905-1906 fire, the opinion is expressed that the workmen will probably dominate the situation and demand an increase in wages. Stocks are moving slowly, and New York jobbers presumably have enough Glass in stock to last well up to November 1. Under these conditions shrewd buyers might obtain concessions on desirable orders from regular prices. Quotations from jobbers' list in this section are as follows: Greater New York, single, 90 and 5; double, 90 and 10 per cent. discount. Eastern District, except the Boston District, 90 and 10 per cent. discount, for all sizes of single and double strength. In the Boston District quotations are reported as being 90 and 15 for all sizes of single and double strength.

Linseed Oil.—Buyers who purchased large lots of oil last fall and winter have not exhausted their contracts and are still accepting deliveries because crushers insist upon it. The Flax Seed crop is usually considered free from damaging climatic conditions after September 1, and crop conditions lead to the belief that the present crop will exceed the one of last year from 1,500,000 to 2,000,000 bushels. It will be recalled that last year's crop was an exceedingly large one. Receipts of old Seed continue heavy, and if nothing occurs to damage the new crop 30-cent Oil would not surprise some in the trade. With crushers loaded down with Oil and unsold stocks in jobbers' hands, demand is not likely to exceed actual requirements for the next 30 days. The price of City Raw in this market has fallen off 1 cent during the week. Quotations are as follows, according to quality and seller: City Raw, 38 to 39 cents per gallon; out of town Raw, 36 to 39 cents per gallon. Boiled Oil is 1 to 2 cents advance per gallon over Raw.

Spirits Turpentine.—The market has held at unchanged prices during the week and a fair demand for jobbing lots has prevailed. New York quotations are as follows, according to quantity: Oil Barrels, 59½ to 60 cents; Machine Made Barrels, 60 to 60½ cents per gallon.

STANDARD CHAIN COMPANY.

ON Saturday, July 21, a very disastrous fire occurred at the plant of the Standard Chain Company, located at St. Mary's, Ohio. A large brick forge shop was entirely destroyed, together with several other buildings. The engine, boiler and polishing house, as well as the warehouse containing finished stock, were not damaged. As the company operates a number of other plants in various cities some of the St. Mary's Chain makers were transferred to the Braddock plant at Pittsburgh, Pa., and others to the plant at Marion, Ind. A vacant machine shop at St. Mary's was leased by the company and equipped with the necessary machinery transferred from other factories, and within one week from the time of the fire the new plant was in operation, working double turn. Owing to the other plants of the company being so well equipped with reserve machinery and its prompt action in transferring it no serious interruption occurred in the production of Chain or in shipments to customers. As soon as the insurance loss is adjusted the plant will be rebuilt on an enlarged scale.

SIMMONS HARDWARE COMPANY'S COURSE APPROVED.

SOME time since we announced the discontinuance by the Simmons Hardware Company, St. Louis, Mo., of its retail department. That this action is appreciated by the retail Hardware trade is evident from a letter lately received by the company from the Kansas City Retail Hardware Dealers' Association, A. L. Brunner, secretary. At a recent meeting of this association approval was expressed of the company's step and of the reasons leading up to it, as explained in the letter of E. C. Simmons, published in *The Iron Age*, May 10. The letter of the association then goes on to say that the members are pleased to know that the company has quit the retail business, and though they feel assured that the company has "always maintained prices and run its retail store on strictly legitimate retail principles," at the same time they believe that the operation of a retail department "had a bad effect on the smaller jobbers and influenced them to retail and compete with the retail dealer," to his detriment.

DURING the House Furnishing Exhibition, to be held in Madison Square Garden the week beginning August 6, Central Stamping Company, 24 Cliff street, New York, will occupy parlor 9, ground floor, Fifth Avenue Hotel. A complete line of samples will be displayed, and the company's salesmen will be on hand to meet and entertain its customers and friends.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our catalogue department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

THE F. & N. LAWN MOWER COMPANY, Richmond, Ind.: Catalogue illustrating the company's lines of Ball Bearing, High Grass, Standard and Gem Lawn Mowers.

THE IRWIN AUGER BIT COMPANY, Wilmington, Ohio: Catalogue of the Irwin Solid Center Stem Auger, Car, Ship Auger and Ship Auger Car Bits; Ship and Derrick Augers; Machine Bits; Nut, Ring and Rafting Augers; Conveyors, Nail Sets, &c.

WAGNER MFG. COMPANY, Cedar Falls, Iowa: Catalogue relating to Steel Hand Sleds, Bobs, Coasters, &c.

CHATTANOOGA ROOFING & FOUNDRY COMPANY, Chattanooga, Tenn.: Booklet illustrating and describing the new Century Metal Shingles; also Valley, Ridge Roll and Crestings.

ACME KITCHEN FURNITURE COMPANY, Chattanooga, Tenn.: Illustrated catalogue devoted to Mantel and Upright Folding Beds, Combination Cases, Chiffoniers, Wardrobes, Kitchen Cabinets, Cupboards, Kitchen Safes, and Biscuit Beater.

THE LA FAYETTE FENCE & MACHINE COMPANY, La Fayette, Ind.: Catalogue devoted to Ornamental Fences for residences, churches, parks and cemeteries; Hitching Posts and Auto-Cars for childrens' use.

ACME WHITE LEAD & COLOR WORKS, Detroit, Mich.: General catalogue covering goods offered to the store trade; also manufacturing catalogue. Both contain cards, showing a great variety of colors.

TRADE ITEMS.

GEO. F. ROOKE, Providence, R. I., has purchased from B. A. Ballou and the Mechanical Accountant Company the building located at 17 Warren street, Providence, and also the machinery and tools formerly the property of these two parties. The property consists of a building two stories high, 25 x 95 ft., with two two-story ells, each 26 x 30 ft., a hardening shed 25 x 20 ft., and a one-story shed and storehouse 12 x 95 ft. Mr. Rooke will operate under the name of the Providence Mfg. & Tool Company, and will carry on a general machinist business, but primarily will manufacture adding, accounting and registering machines. He will also manufacture the adding machine known as the Mechanical Accountant. The new company will be prepared to do fine tool work, of which they will make a specialty. They will also be fitted to do accurate grinding, press and milling machine work. Plans are under way for adding a third story to the building, and when the organization is complete 75 to 100 hands will be employed.

J. C. MCCARTY & Co 10 Warren street, New York, have been appointed general selling agents for the Ohio Shovel & Stamping Company, Canal Dover, Ohio, manufacturer of a complete line of plain, hollow back and back strap Shovels, Scoops and Spades. This company is successor to the Toledo Stamping Company, but its plant at Canal Dover is entirely new and equipped with the latest improved machinery.

THE LISK MFG. COMPANY, Canandaigua, N. Y., reports a large demand for its new Sanitary Enameled Roaster, and during the present week the shipments of this utensil to retail Hardware merchants in all parts of the country will aggregate 15 carloads.

LUTTRELL HARDWARE COMPANY, Brewton, Ala., makes a specialty of Sash, Doors and Blinds. In the latter connection the company has issued a booklet containing the official price-list of Sash, Doors and Blinds adopted October 15, 1903, comprising about 130 pages, in addition to which there are about 50 pages devoted to selections from the company's other lines. This little book is being sent to merchants with whom they deal, and also on request to house owners, contractors, carpenters and others who are interested in the line of goods covered.

NATIONAL-ACME MFG. COMPANY, Cleveland, Ohio, has transferred its New England office, formerly located at 176 Federal street, Boston, to 95 Liberty street, New York. M. M. Brunner, who managed the office in Boston, will continue in charge.

THE AMERICAN FORK & HOE COMPANY will add to its Frankford, Philadelphia, plant, a two-story warehouse 60 x 165 ft., connected with the main building by an overhead bridge and with a loading platform to present sidings. This new building will be used entirely for warehouse purposes and will facilitate handling stock, especially during the busy season, much more expeditiously than heretofore.

AMONG THE HARDWARE TRADE.

J. M. Ellingsworth has purchased the Hardware and furniture business of Brandt & Paap, in Syracuse, Neb.

John L. Henrichs has purchased the store of Thos. Nelson, in Diller, Neb., and will carry a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting and Athletic Goods and furniture.

O. Colton has lately embarked in the Hardware business at Custer, Mont.

J. H. Morris has succeeded the Buckley Hardware Company at Buckley, Wash., and will enlarge and continue the business.

The Lookout Hardware Company, Lookout, Idaho, will open a branch store at Kippen, Idaho.

The partnership heretofore existing between Fred. C. Burney and J. G. Burney under the style of Burney Bros., Little Falls, N. Y., has been dissolved by mutual consent. The business will be continued by James G. Burney, who has purchased the interest of his brother. Fred. C. Burney, who retires from the firm, will hereafter devote his time and energies to the Mohawk Desk Company of Herkimer, in which he has recently acquired an interest.

Henry Yutzy, Rockwood, Pa., is moving his Hardware store from the old building to a fine brick building that has just been completed.

Joseph Little, Hardware merchant, Washington, Pa., will in the near future take possession of a large three-story building which is being erected for him on East Railroad street.

The Schell Hardware Company, Uniontown, Pa., has been forced to add another story to its present building, 31 x 101 ft., on account of its rapidly growing business.

Spencer Hardware Company, Keene, N. H., has recently completed and occupied a new concrete storehouse about 40 x 80 ft. in dimensions and two stories high. The building has been found very satisfactory and well adapted to the purposes for which it was built. The company's main store occupies the first floor and basement of another building measuring 32 x 125 ft.

The Ohio Hardware Association expects to have 1000 members by next February, when the annual meeting will be held at Columbus. Members are coming into the fold right along even at this season, which is an unusual experience for the association. A meeting of the Executive Committee will soon be held, when plans for the convention will be determined.

Association Notes.

ASSOCIATION IN GEORGIA.

At a well attended and enthusiastic meeting at Macon, on the 17th ult., the Georgia Retail Hardware Association was formally organized, as a result of efforts to which reference has already been made in these columns. The new association has started on its career with a membership of about 60 of the best known merchants of the State. The following officers were elected: W. W. Robinson, Dublin, president; W. G. Raines, Statesboro, first vice-president; J. C. Hollingsworth, Dawson, second vice-president; C. M. Tillman, McRae, secretary-treasurer. The Executive Committee comprises Messrs. Robinson and Tillman and J. J. Golden, Tifton; D. A. Smiley, Claxton, and George W. Woodruff, Winder. In addition to the work pertaining to the organization of the association there was some informal discussion as to freight rates and the adjustment of claims by the railroads. M. L. Corey, Argos, Ind., secretary of the National Retail Hardware Association, was present at the meeting and took a conspicuous part in the proceedings. It was determined to hold the next meeting at Tifton.

MICHIGAN HARDWARE CONVENTION.

The twelfth annual convention of the Michigan Retail Hardware Association, which will be held at the Hotel Cadillac, Detroit, August 8, 9 and 10, gives every promise, we are advised, of being the largest and most successful yet held by this organization. It is confidently expected that 400 or 500 merchants will be in attendance. As already noted the sessions will extend over three days, on the afternooon of the last of which one of the most enjoyable of the entertainment features will be held—namely, the boat ride tendered by the Detroit manufacturers and jobbers. It is therefore hoped that those who attend the meeting will remain and participate in what is sure to prove a delightful excursion.

The business programme of the convention has been arranged with great care, and a number of instructive papers on practical topics will be read, which will be followed by general discussion. Several addresses by Hardwaremen of national reputation will also contribute to the interest and enjoyment of the gathering. Among the papers will be the following: "Fixed Retail Prices on Standard Goods and Their Effect," by O. J. Darling, secretary of the Detroit Retail Hardware Association; "Every Day Paint," by G. B. Heckel, secretary of the Paint Grinders' Association of America; "Our Friends, the Jobbers, and Their Salesmen," by G. J. Kastenberg, Greenville; "How to Sell Stoves," by W. T. Leckie, Estate of P. D. Beckwith, Dowagiac, Mich.; "The National Hardware Association—How Can It Best Co-operate with the Retail Merchants of the Country," by T. James Fernley, secretary-treasurer, Philadelphia, Pa.; "What It All Means," by M. M. Callaghan, Reed City. There will also be an address by a representative of the American Hardware Manufacturers' Association. Informal addresses will be made by E. M. Bush, Evansville, Ind., president; W. P. Bogardus, Mount Vernon, Ohio, past president, and M. L. Corey, Argos, Ind., secretary of the National Retail Hardware Association.

A rate of a fare and a third on the certificate plan has been granted by the railroads, good from the 4th to the 14th inst., inclusive. A. J. Scott, Marine City, secretary of the association, will be pleased to answer any inquiries relative to the meeting.

NEBRASKA.

The Nebraska Retail Hardware Association has chosen February 5, 6 and 7 as the time for the next annual convention at Omaha. It is likely that Hardware exhibits will be a feature of the gathering, but this has not yet been definitely determined.

IOWA.

The Iowa Retail Hardware Association is planning a four-day meeting for 1907, to be held at Des Moines, Tuesday to Friday of the third week of February. Arrangements are making for the accommodation of exhibits by manufacturers and jobbers, but the details have not yet been worked out, as the building in which it is proposed to hold the convention and conduct the exhibition, the Shriners' Temple, is now in course of construction. We understood that the membership roll is receiving constant accessions and that association matters never looked better than at the present time.

MISSOURI.

The time and place for holding the next annual meeting of the Missouri Retail Hardware Association have not yet been decided. St. Louis or Kansas City will probably be chosen. If the former city is selected it is likely that something will be done in the way of a Hardware exhibition. There is however a disposition to go to Kansas City and hold the meeting simultaneously with the convention of the Western Implement Dealers' Association. The latter association comprises in its membership many of the Hardware merchants of the State who are not members of the Hardware Association. Some of these, it is thought, might be induced to join if their attendance at one or more of the sessions could be secured.

INDIANA.

The Indiana Retail Hardware Association has not yet completed all the arrangements for its next convention, although the time and place have been chosen—namely, February 20, 21 and 22 at Indianapolis. Tomlinson Hall, where the association held its last meeting has again been selected as the scene of the deliberations. Hardware exhibits will be a prominent feature of the gathering. It is expected that the entire main hall will be reserved for the displays, the sessions being held elsewhere in the building. The forenoons will be devoted to the work of the association, leaving the members free to visit and inspect the exhibits in the afternoon. It is believed that this division of time will meet with the approval of both members and exhibitors. Financially and numerically the Indiana Association is in better shape than ever before.

NEW ENGLAND.

As the trade is aware, the next annual meeting of the National Retail Hardware Association will be held in Boston. The date of this meeting has not yet been determined, and as the New England Hardware Dealers' Association desires to hold its convention about the same time the officers are awaiting word from the National body as to its pleasure. It is more than likely that provision will be made for a Hardware exhibition, especially in view of the fact that nearly all of those who made displays at the last two meetings of the association, together with a number of other manufacturers, have already made application for space.

WISCONSIN.

Partial arrangements for the next annual meeting of the Wisconsin Retail Hardware Association were made at a recent gathering of the members of the Executive Committee. The Hardware exhibit feature was decided on. It was also determined to confine the convention sessions to the forenoon, permitting the members to fraternize with the manufacturers' representatives and inspect the exhibits in the afternoon. It is also likely that fewer papers will be read at the meeting, leaving more time for general and informal discussion. As an indication of the continued growth of the association, it is interesting to note that nearly a score of members have been secured since June 1.

THE NEW YORK HAND BOOK.

J. B. Foley, Syracuse, N. Y., secretary of the New York State Retail Hardware Association, advises us that he still has a number of copies of the Handbook, containing the proceedings of the last annual meeting of the association at Binghamton. The association is desirous of placing a copy of this book in the hands of every Hardware merchant in the State, so that the retail trade may be posted as to the organization doings, and if any have been overlooked and will make application for one Mr. Foley will be pleased to send it.

HARDWAREMEN AND THE SPORTING GOODS LINE.

BY E. T. K.

There isn't a line more pleasant or more profitable for a wideawake, up to date Hardware merchant to handle than a carefully selected and well kept stock of Sporting Goods. Many retailers have discovered this fact during the past few seasons, and if the trade generally was aware of the opportunities presented by a line of goods catering to the lover of outdoor sports the number of Hardware stores handling them would be materially increased.

IN the first place, Sporting Goods are attractive of themselves. When a man goes into an establishment and buys a Tool or other article of Hardware he does so because he needs it, but does not feel any great enthusiasm in the matter, for the purchase simply represents the acquirement of a necessity and an ordinary item of expense to him.

A Man Buys a Gun,

Fishing Rod or a bit of sportsmen's equipment for a totally different reason. It is because it appeals to him from his æsthetic point of view in a similar manner as a picture or other work of art would.

In purchasing Tools or Hardware he wants to pay just as little as he can safely expend and be sure of quality and durability. When it comes to the purchase of Sporting Goods, however, he wants to

Spend Just as Much as He Can Afford

and secure just as good a Rod or Gun as his pocketbook will allow.

That this is an actual truth is demonstrated by the fact that a sportsman who can afford it will spend from two to six times as much for a handsomely finished, finely engraved and exquisitely checked Gun, when he is perfectly aware of the fact that a much cheaper Gun made by a reputable manufacturer will shoot just as hard, last just as long and give just as good actual results in the field or at the trap.

A man who can catch just as many fish with a $3.50 Lancewood Rod will pay from $10 to $25 for one of split bamboo, if he can possibly afford it.

Sentiment Has Much to Do with It.

It is just the difference between the average Hardware being a necessity and Sporting Goods being a luxury that enables the right kind of Sporting Goods to carry a good profit. One is a matter of business with a purchaser, the other a matter of sentiment.

Then, too, look at the difference between a window display of Hardware and Tools and another in which an equal value of Sporting Goods are exhibited. A man who really needs some articles of Hardware or additions to his Tool chest will gaze at their window exhibit

In a Perfunctory Sort of Way,

but in front of the Sporting Goods layout you will find a collection of men of all ages who are examining and criticising the display with real interest, and if there is any thing new and novel or especially handsome among the assortment the chances are very largely that there has been created in the minds of the spectators a desire for possession, which often leads to a direct purchase.

If a man has a fairly complete kit of Tools he is not going to make any additions to it unless impelled thereto by absolute necessity and the actual occurrence of a case in which the needed Tool must be used.

On the other hand, a man may have a rack full of Guns and Rifles and yet he always wants just one more, and what is more to the point he is going to get just that one more as soon as he can afford it.

A Sportsman Is a Good Purchaser

because he is on the lookout for novelties, even more keenly than the retailer, and he has a wild and inborn desire to add to his outfit every new and meritorious article that is brought to his attention.

A man who will stint himself in regard to the necessities of life will often do the stinting in order that he may make additions to what every one else seems to think a pretty nearly complete outdoor outfit.

An Ever Widening Field.

The retailer of to-day has a field for the exploitation of Sporting Goods many times larger than was offered but a decade ago. Then the men who were shooters, fishermen, campers or canoists were just beginning to be numerous enough to excite no special comment or notice. To-day the man who does not indulge in one or more of these sports is so singular that he excites more remark than the sportsman of a quarter of a century ago did.

The fortnight vacation and the Saturday half holiday during the heated term are now so generally established in the United States and the opportunities which they allow for the indulgence of outdoor sports have been so thoroughly appreciated and readily grasped that manufacturers of to-day in many lines figure their unit of product by the thousand instead of by the hundred.

As a consequence of the manufacture of Sporting Goods in large quantities the cost of production and the retail selling prices have decreased to such an extent that

The Man of Moderate Means Can Afford

to equip himself with an outfit at which only a few years ago any but the fairly well to do would have looked askance. This simply means that the market now caters to thousands of purchasers where it was once confined to tens. This by itself would be a healthy tendency if it affected only the matter of Firearms and Rods and Reels. But the moment a man owns a Shotgun or Rifle

He Becomes a Prospective Purchaser

for Ammunition, Gun Cleaners, Reloading Tools, Decoys, Hunting Clothing, Recoil Pads and the hundred and one incidentals that go to make up a shooter's outfit. It is the same with the fisherman. When he has purchased his Rod and Reel he has just commenced. There are Lines, Flies, Hooks, Leaders, Swivels, Floats, Sinkers, Artificial Baits, Tackle Cases, Minnow Traps, Creels, Disgorgers and an unending list of things that he is going to purchase from season to season.

The sportsman is one of the best customers that ever came down the pike, for the simple reason that he is so earnestly anxious to try new goods and keep himself posted regarding the latest improvements in them.

FLINT & WALLING MFG. COMPANY.

FLINT & WALLING MFG. COMPANY, Kendallville, Ind., has just published an interesting catalogue devoted to Tanks and Towers as used in connection with Automatic Sprinklers and water supply systems, giving explicit information in regard to this line. The book is handsomely illustrated with photographic reproductions of original outfits installed by the company. While the company has made these goods for a number of years, it has recently brought out some new ideas in Tower construction, which it feels will be regarded with favor by insurance companies and by purchasers of this class of goods.

The Woonsocket Supply Company, Incorporated, 243-245 Main street, has been organized under Rhode Island laws to engage in the Hardware, mill supply and plumbing business. The company is capitalized for $10,000, and its officers are: President, Frank E. Holden; secretary, Arthur C. Milot; treasurer, Fred A. Gardner, and general manager, Fred S. Coburn. General mill furnishing, steam heating and plumbing and heavy mill piping and pipe cutting will be the chief ends of the business, together with Hardware and Electrical Supplies.

OKLAHOMA HARDWARE AND IMPLEMENT DEALERS' ASSOCIATION.

THE third annual convention of the Oklahoma Hardware and Implement Dealers' Association was held at Oklahoma City July 10, 11 and 12. The Chamber of Commerce Building was the scene of the deliberations. There was a large attendance. At the opening session Mayor J. F. Messenbaugh welcomed the merchants in a few well chosen words, a felicitous response for the association being made by A. L. Severance, Durant, I. T. After the roll call and reading of the minutes of the previous meeting by the acting secretary, D. C. Patterson, Oklahoma City, the following committees were appointed by President Pettee:

MEMBERSHIP: Gus Talliaferro, Oklahoma City; R. J. Miller, Stroud; Mr. Gott, Ponca City.
RESOLUTIONS: A. D. Acres, Norman; A. L. Severance, Durant, I. T.; W. W. Storm, Oklahoma City.
AUDITING: N. B. Utt, Elk City; M. C. Hale, Tulsa, I. T.; F. M. Spangler, Mulhall.

The Tuesday afternoon session opened with an able address by C. W. Rathbun, Oklahoma City, followed by a paper by T. C. Ham, Oklahoma City, representing the traveling men, which was well received. A. D. Acres, Norman, then addressed the meeting on the subject of mutual insurance and an Insurance Committee was appointed, consisting of N. B. Utt, Elk City; O. A. Smith, Watonga, and Mr. Acres. The remainder of the session was given up to short talks by various members, the principal discussion being trailers or peddlers.

In the evening the merchants and their families were entertained at a theater party at Delmar Garden, which was largely attended and thoroughly enjoyed.

The Wednesday morning session opened with a band concert. Mr. Shapleigh of the Norvell-Shapleigh Company, St. Louis, made an address, speaking in warm terms of the present attainments and future prospects of the new State of Oklahoma and giving large credit to the integrity and energy of her traveling men. In the course of his remarks Mr. Shapleigh said that this meeting might be deemed a successful one, if nothing further had been accomplished than the inauguration of a mutual insurance department.

District Clubs.

A paper followed by M. C. Hale, Tulsa, I. T., on the "Formation of District Clubs." Mr. Hale urged this as the best means of getting merchants together and obtaining results. His suggestion that the association appoint a secretary to visit the different clubs and to organize others was referred to the Nominating Committee. Another interesting paper was that by Harry Mead, Shawnee, on "Jobbers Selling at Retail, and Other Trade Abuses."

Colonel Conover of Richards & Conover Hardware Company, Kansas City, Mo., then delivered a very interesting address, comparing the experiences of the early days in the Hardware business with the conditions of the present time. A number of short talks by the members followed. J. H. Johnston, Oklahoma City, advised the appointment of a regular paid secretary.

The following Nominating Committee was appointed: A. L. Severance, Durant, I. T.; N. B. Utt, Elk City; J. M. Cooley, Holdenville, I. T.; S. P. Larsh, Tecumseh, I. T.; William Bruington, Pawnee.

A Grievance Committee was appointed as follows: J. H. Johnston, Oklahoma City; C. C. Chapell, Asher; R. E. Braden, Paul's Valley, I. T.

Credits and Collections.

The Wednesday afternoon session was opened with a paper on "Credits and Collections," by T. T. Eason, Marlow. He explained that what is known as the Federated Club is composed of the secretary and one delegate from each organization in the two Territories and that its purpose is to protect merchants from fake advertising and to give them the financial rating of their customers. Men moving from one town to another have their rating reported immediately to the town to which they have gone. The list is revised every day and the information was referred to as worth much more than the cost of obtaining it.

Mutual Insurance.

O. A. Smith, for the Insurance Committee, reported that the committee had agreed that it would be best to leave the matter to a permanent insurance committee, and suggested that the president appoint such committee to work out a plan for the mutual benefit of the members, and that circular letters be sent to each member outlining this plan. The report was adopted and the president was empowered to appoint the committee. The committee chosen comprises Harry Mead, Shawnee; W. W. Storm, Oklahoma City, and S. P. Larsh, Tecumseh, I. T.

"Catalogue House Competition" was the subject of an interesting paper by F. M. Spangler, Mulhall.

T. J. Griffith, Oklahoma City, treasurer, reported a balance on hand of $59.30.

On Wednesday evening the merchants were guests of the Oklahoma Hardware and Manufacturers' Club at a Dutch lunch, given in the rooms of the Indiahoma Club, which was greatly enjoyed. At the same time the ladies were entertained with music at the Lee Hotel.

Market Day.

Thursday morning's session was opened with the new president, O. A. Smith, in the chair. An experience meeting occupied most of the time, the principal discussion being methods of advertising. It was suggested that the first Monday in each month be made a market day, this plan having been tried by the town of Perry and found to bring good results and to enlarge the circle of customers. Col. H. C. Staver, president of the Staver Carriage Company, Chicago, made a short address in which he congratulated the members upon attaining statehood, and emphasized the fact that much depended on starting right; that it is much easier to get the right laws passed in the first place than to get proper legislation after bad laws have gone into effect.

Resolutions.

The following resolutions were reported and adopted:

Whereas, By the Grace of God and the act of the United States Congress, Oklahoma and Indian Territory have been made one State; and

Whereas, The name of our association is now inappropriate, the committee recommend that the name of this association shall henceforth be The Oklahoma Retail Hardware and Implement Dealers' Association; and

Whereas, The need of thorough organization being apparent, we recommend the organization of local clubs, which shall have the same relation to our State organization as the State Association has to the National Retail Hardware Association and National Federation of Implement and Vehicle Dealers.

We also recommend the appointment of a Legislative Committee, whose duty shall be to urge legislation in protection of retail trade interests.

In addition to these recommendations, be it resolved:

1. That the new wagon warranty, as proposed by the National Manufacturers' Association, does not meet with the approval of the membership of this association, and that until manufacturers are prepared to show us that checked Hubs and cracked Sideboards are due to some acts or fault on our part we shall continue to consider them defective or poorly seasoned timber and as such properly subject to warranty, and that a Wagon which develops defects within one year is a defective Wagon to the user, and that he is entitled to protection.

2. That it is the sense of this association that a system of reciprocal insurance is safe and profitable to the interests of the Hardware and Implement dealer.

3. That the thanks of this association are due to the J. I. Case Threshing Machine Company for the use of its building for exhibition purposes.

4. That we extend our thanks to the Oklahoma City Hardware and Manufacturers' Club for the courtesy of this evening's entertainment and its assistance in advertising this convention.

5. That we are grateful to the advertisers in our official programme for their patronage.

6. We wish to thank the jobbers and all traveling salesmen, local dealers and citizens of Oklahoma, who have so cordially assisted us in the success of this meeting.

7. Our thanks are due to representatives of the trade papers for their reports and interest in the success of our association meeting.

Resolved, That we, the members of the Retail Hardware and Implement Dealers' Association of Oklahoma City, express our thanks to our retiring president, W. J. Pettee, for his untiring efforts to make this one of the strongest associations of its kind, and we hereby assure him of our continued esteem.

New Officers.

The Committee on Nominations reported the following officers, who were unanimously elected:

PRESIDENT, O. A. Smith, Watonga.
FIRST VICE-PRESIDENT, Harry Mead, Shawnee.
SECOND VICE-PRESIDENT, Wm. Murdock, Ralston.
SECRETARY, D. C. Patterson, Oklahoma City.
TREASURER, W. W. Storm, Oklahoma City.
EXECUTIVE COMMITTEE: A. D. Acres, Norman; M. C. Hale, Tulsa; F. M. Spangler, Mulhall; J. M. Cooley, Holdenville; Frank P. Pfaff, Anadarko.

W. J. Pettee, Oklahoma City, was chosen delegate to the National Retail Hardware Association, and Sam Noble, Ardmore, delegate to the National Federation of Implement and Vehicle Dealers' Association. Geo. H. Brett, Ponca City; W. J. Pettee, Oklahoma City, and Harry Mead, Shawnee, were constituted a committee on legislation.

ABUSES IN THE IMPLEMENT TRADE.

UNDER the title of "Trade Ills and Their Remedies," a symposium of letters from retail merchants was published in a recent issue of *Farm Implement News*, giving their ideas as to the greatest evils besetting the implement business. Writers located in various parts of the country were practically unanimous in the view that

Competition Is Excessive

on nearly all lines covered by this head. One stated that although nearly ten miles from the railroad station he had had to contend within five years with the competition of nine persons who could not fairly be listed as established merchants. These included blacksmiths, millers, grocers, postmasters, &c., "with a visible capital of from two cents up, but not very far up." The business is demoralized, it is declared, by the incompetence and irresponsibility of agents who will sell anything from a cream separator to a threshing machine merely as a side or temporary issue.

Irregular Sales

by jobbers and manufacturers are said to have been most instrumental in bringing about this condition, enabling persons to get implements at wholesale prices who were not entitled to such recognition. With the jobbers the trouble frequently lies in being so anxious for business as to take orders from irresponsible parties who either have no intention of paying for them and so don't care what price they get or else after disposing of a few of their machines have to close out the balance at cost in order to pay for them, thus demoralizing the market for the legitimate dealer.

Jobbers' Errors

Manufacturers are said to be equally culpable in supplying their goods direct to farmer or cross-roads agents. They do this most frequently in territory where their goods are not known and they are anxious to secure an introduction without waiting to interest some established merchant who is probably handling some other line. Manufacturers are also so eager to increase their sales that they establish agencies too near together. Thus the agents get into competition among themselves and prices are cut to an unsatisfactory margin.

Manufacturers Too Anxious

Farmer agents are a hardship to the retail trade, not only because they add to the number among whom the business of the community is divided but especially because not being business men they do not know what a business profit is. They do not depend on their sales of implements for a livelihood, but merely want to make a dollar or two on the side, and they will therefore sell an expensive machine at a margin on which a merchant could not possibly afford to handle it.

Farmer Agents

Canvassing is referred to as an evil in the implement business, since it not only adds greatly to expenses, but tends to increase competition and leads to price cutting. This is especially likely where dealers are situated close together and one sends his solicitor into the territory of another. Nine times out of ten the latter would rather sell at cost than lose the business which he thinks belongs to him. A shrewd buyer knows how to take advantage of such opportunities to the discomfiture of both parties desiring his trade.

Canvassing

Catalogue houses and co-operative unions do not seem to be regarded as a serious menace to the implement business. The statement is made that one or two examples of the goods they supply are enough for any community. The principal annoyance arising from this source comes through weak-kneed merchants who cut their prices when people come and quote the catalogue house advertisements to beat the merchants down, although they have no idea of sending away for the goods.

Catalogue Houses

Two writers state that the greatest drawback to the implement trade at this time is the method of a large manufacturing company of having as agents in one locality as it has different makes of machines to sell. This leads to cut prices and small profits.

Policy of One Maker

Other Evils

are referred to, among which may be enumerated overbuying, cutting prices to friends, too liberal guarantees, incompetent salesmanship, inability to talk quality, and the abuse of credits.

Organization the Remedy.

For all these evils and abuses the most effective remedy was generally agreed to lie in organization. Merchants were urged not only to identify themselves with associations but to take an active part in their direction and management. In this way only, it was declared, could they hope to stop irregular sales by manufacturers and jobbers, as well as price cutting, abuse of credit and the heavy expense of canvassing. Writes a merchant in North Dakota, "The old adage 'Competition is the life of trade' is a back number. Intelligent co-operation on the part of dealers is like a cross cut saw: it works both ways, eradicating evil and promoting good."

Hagebusch & Weaver have purchased the business of the Weaver Hardware Company, Springfield, Mo., retail Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting and Athletic Goods.

T. J. McDowell has sold a half interest in his business to J. L. Phillips, and the new firm, McDowell & Phillips, will continue the Shelf and Heavy Hardware, Stove, Tinware, Paint and Sporting Goods business at Montesano, Wash.

H. O. McClure has succeeded to the business of McClure-Graef Hardware Company, Tulsa, I. T., wholesale and retail Shelf and Heavy Hardware, Stoves, Tinware, Sporting and Athletic Goods.

Forsyth Hardware & Saddlery Company, Forsyth, Mont., is preparing to move its stock to a new location in the same town, where it will enjoy enlarged accommodations and improved facilities.

Keith Whimster has opened a Hardware store at Fernie, B. C.

REQUESTS FOR CATALOGUES, &c.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM METZ & WIEBE, successors to H. Klaphacke in the Hardware business, 1574 and 1576 Freeman avenue, Cincinnati, Ohio. The firm makes a specialty of Mechanics' Tools.

FROM ALLEN & HOULEHAN, who have opened a retail store in Darlington, Iowa. This is a branch of the business of T. J. Houlehan, Crawfordsville, Ind. The stock carried will include Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints and Oils.

FROM SOLOMON & LANCE, Jermyn, Pa., who have recently moved into their new building. The firm carries a retail stock of Shelf Hardware, Stoves, Tinware, Paints, Oils, Mining Supplies. Attention is also given to plumbing and heating.

FROM HOWARD BROS. & MCCUEN, who have succeeded to the business of the Howard Hardware Company in Boynton, I. T., retail Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils and Sporting Goods.

FROM MCCLELLAN & GOTWALT COMPANY, York, Pa., wholesale and retail Hardware and Manufacturers' and Contractors' Supplies, which desires printed matter and quotations relating to novelties or house furnishings somewhat out of the ordinary and not generally carried by the Hardware trade.

FROM F. W. SANNET, Tremont, Pa., who is opening a branch store at Minersville, Pa. He has secured an excellent warehouse and expects to get a storeroom soon.

FROM METCALF HARDWARE COMPANY, which has commenced the retail business in Slocomb, Ala., carrying Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods and Building Materials.

FROM GALLEHER BROS., who have purchased the business of Reuben Taft in Stewart, Neb. The firm will carry a retail stock of Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting and Athletic Goods.

FROM NEMECHECK BROS., who have purchased the business of Carmichael & Smith in Table Rock, Neb. They will carry Shelf and Heavy Hardware, Stoves, Tinware, Paints, Oils, Sporting and Athletic Goods.

Louis Hoeltje has purchased the business of A. & G. Runkle, in Lisbon, Iowa, and will carry a stock of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Paints, Oils, Sporting Goods and Queensware, and also conduct a plumbing shop.

The Brown Company, retail Hardware, Norfolk, Conn., is to occupy a new building now in process of erection, to be 40 x 60 ft. and two stories. The building will be of concrete blocks, trimmed with Harvard brick and faience, with red tile roof.

N. R. STREETER & Co., Rochester, N. Y., manufacturers of various kinds of labor saving Kitchen Utensils and who are represented in New York by William H. Jacobus, 155 Chambers street, recently executed an order for one of their Sterling Slicers No. 90 for use on the United States battleship Indiana. This Slicer automatically cuts meats, bread, &c., from as thin as a wafer, through 17 easy adjustments, up to ¾-in. thickness.

STILLSON WRENCH TRADEMARK.

TRADEMARKS have recently been issued to the Walworth Mfg. Company, Boston, Mass., by the United States Patent Office, for use in connection with the company's Stillson Wrenches. The Wrenches hereafter manufactured by the company will be stamped on the handle

with the diamond Stillson trademark, which is reproduced herewith, and on the jaw with a device bearing the letter W. This step was rendered necessary by the many imitations of the original Stillson Wrench which are now manufactured and put on the market, and the trademarks are designed as a protection both to the Walworth Company and to merchants who desire to purchase the company's product.

MISCELLANEOUS NOTES.

Olisoap.

John MacKenzie, Troy, N. Y., represented in New York by C. E. Peabody & Co., 155 Chambers street, is manufacturing what is called Olisoap for cleaning oiled or waxed floors. In use the floor or surface is dampened and the olisoap applied, rubbing then with brush or broom, after which the floor should be well washed with cold water. This process, it is said, will remove dirt and grime from dark and dingy surfaces without injury to the grain of the wood, thereby freshening what from frequent applications of oil or wax has become a dark, unsightly surface. It is sold regularly in barrels of 400 to 450 pounds, half barrels of 200 to 250 pounds, and kits of 60 pounds. It can also be put up in other quantities when so ordered in sufficient volume.

Onondaga Mfg. & Promoting Company.

The Onondaga Mfg. & Promoting Company, Syracuse, N. Y., for which C. E. Peabody & Co., 155 Chambers street, New York, are representatives, has recently put out several new specialties, among which may be noted the Chi-Nee Clothes Sprinkler, the Sure Death Fly Killer and the Scientific Toaster. The sprinkler holds a pint or more of water. The reservoir is circular, being 4½ in. in diameter at sprinkler end, which is a disk with perforations, and tapering for 3½ in. to a diameter of 3⅛ in. The 3¼-in. handle tapers slightly, being about an inch across at the open outer end, through which the reservoir is filled, the water being retained by a cork. All of the sprinkler is blued but the sprinkling disk, which is tinned. On the side opposite the handle is a small wire loop by which to hang it up when not in use. The fly killer is a 4-in. lacquered metallic disk in which is placed gray poison fly paper covered with 12-mesh screen wire which is held securely in place by turning and crimping neatly the edge of the metal disk. This leaves ample room above the wire for saturating with water the poison paper, making a handy self-contained article, in contrast with placing similar paper in a wet dish without any protection. The toaster is designed for service in connection with either oil, gas or coal stove. There are two coppered wire handled surfaces, the hing-

ing of which gives about ⅞ in. inner space. The surface to be used next an oil or gas flame is tinned sheet metal with small circular perforations, bread or other material being placed on top of the other surface, which is of wire 3-16 in. mesh. Over a coal fire the material to be toasted can be placed on the coarse mesh, and between the two surfaces as with an ordinary toaster or gridiron. The dimensions of this article are 9⅜ x 6½ in.

Ford's Brace Screw Drivers.

Ford Auger Bit Company, Holyoke, Mass., is manufacturing new screw driver bits of a high grade of crucible steel. It is stated that much thoroughness and care is taken in each operation of manufacture and that the tempering is done by a special process which prevents the tools bending or breaking. The bits are made in 4 and 6 in. lengths, with points ¼, 5-16, ⅜, ½ and ⅝ in. wide. Each bit bears the company's name and is guaranteed.

Hendee-Katz Brush Company.

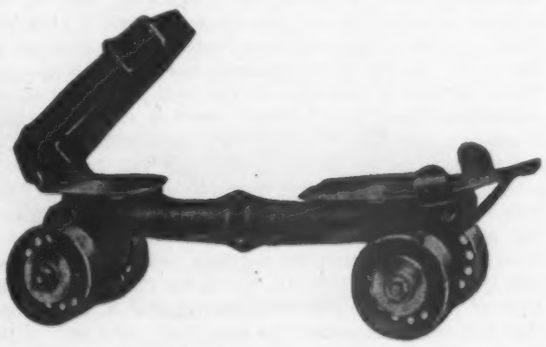
The brushes manufactured by Hendee-Katz Brush Company, Milwaukee, Wis., contain wire, either alone or mixed with fiber and bristles. The distinctive feature of the company's line of hair, clothes and horse brushes, brooms and sweepers lies in the fact that elasticity is secured in these mixed goods, so that they clean and sweep satisfactorily and wear better than brushes made without wire.

Glascock's Racer or Hill Climber.

The Glascock Bros. Mfg. Company, Muncie, Ind., has put on the market for the present season a hand car called the Glascock racer or hill climber, which is referred to as most admirably adapted to the proper development of the abdomen, chest and spine of children. The cars are made in different sizes, for children from 2 to 6 and from 6 to 15 years of age, and include a tandem. The cars have three different motions. There are no dead centers, so that children can propel them up hill and over rough streets. The gearing is completely incased, to keep it free from dust and dirt, and to prevent fingers being bruised and clothing torn. The front and rear axles are connected with a solid hard maple reach, and the cars are provided with malleable castings. The company states that it sells to legitimate dealers only, and not to premium or catalogue houses.

Barney & Berry's New Ball Bearing Roller Skates.

Barney & Berry, Springfield, Mass., are putting on the market a new line of ball bearing roller skates as illustrated herewith. The frame is of two parts, being



Barney & Berry's New Ball Bearing Skate.

formed from sheet metal in such a manner as to secure ample strength and at the same time do away with all superfluous weight. The makers state that their experiments have been directed to overcome all the points of weakness heretofore known in roller skate construction, both in the main body of the skate and in the bearings. Only first-class material is used. The size of the balls used in bearings is ¼ in., and emphasis is placed upon the fact that much added durability and efficiency may be expected, on account of this increase in the usual size of bearings. The makers state that their use of retainers in the bearings is another feature, which will add greatly to the life of the bearings and to the ease with which they can be cleaned and adjusted. The skates are furnished in a variety of fastenings, and are mounted on steel, boxwood or fiber wheels. Special reference is made to the attractiveness and durability of the one-piece steel wheel as compared with wheels which are built up of numerous pieces.

Stevens Offhand Target Pistol No. 35.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass., has just put on the market the target pistol shown herewith to meet the demand for an arm of this sort, heavier than the company's Diamond and at a popular

Stevens Offhand Target Pistol No. 35.

price. The off-hand pistol has a heavy butt, with 6-in. barrel, weighing 1 lb. 6 oz., and with 8-in. barrel, weighing 1 lb. 10 oz. These are for use of 0.22 and 0.25 rim fire ammunition, the 0.22 handling 0.22 short, 0.22 long, 0.22 long rifle and 0.22 Stevens-Pope armory cartridges. The accuracy of the pistol is guaranteed.

Keystone Food Chopper.

The Colebrookdale Iron Company, Pottstown, Pa., represented in New York by Wm. H. Jacobus, 155 Chambers street, is manufacturing in three sizes the Keystone Food Chopper here illustrated. The chopper is sold under an absolute guarantee, and among the features to which the company draws attention are ease of operation, will not clog or ball up, no drip from machine, self-sharpening reversible steel cutters, a clamp that will neither slip nor deface top of table, high grade workmanship and handsome appearance.

The inner sides of cylinder or body have a very slight flare forward, which facilitates work of worm or

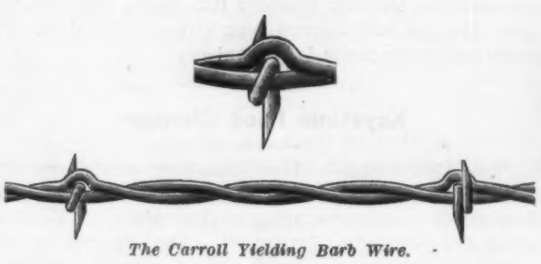
Keystone Food Chopper.

feed screw. At extreme end or point of delivery of cylinder are six longitudinal ribs, the purpose of which is to hold the meat, vegetables, &c., so that as material is forced forward it offers the necessary resistance to the revolving circular cutters, thereby chopping or cutting

instead of mashing. On the end of the worm is a cutting edge formed by filing equally from each side, thus cutting into strips the material being fed, which immediately after is pressed against the holes of the revolving reversible steel cutters chopping into small pieces, varying with the particular cutter used, 3, 9 and 18 hole cutters being furnished for coarse, medium and fine cutting, respectively. There is a fourth plate for grinding nuts, making peanut butter, &c., which has no holes, but a grinding surface like millstones, for medium and fine grinding, according as one surface or the reverse is turned to the substance, this cutter being designed for pulverizing or grinding into paste. All parts are interchangeable, well tinned and incapable of being improperly assembled. The No. 10, weighing 3⅝ lb., chops 1½ lb. per minute; No. 20, weight 4½ lb., has a capacity of 2 lb. per minute, and No. 30, 6¼ lb., 3 lb. meat per minute.

The Carroll Yielding Barb Wire.

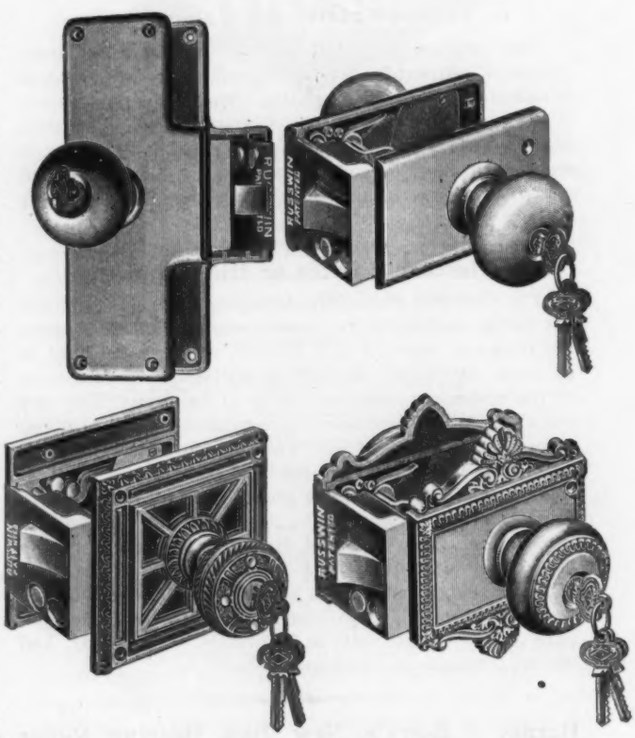
With a view to minimizing injury to stock and increasing the length of its use the Carroll Barb Wire Mfg. & Fence Company, Peoria, Ill., has evolved what is termed the Yielding Barb Wire. The accompanying cuts show the wire and an enlarged view of the barb. The yielding feature of the wire is said to reduce over 70 per cent. the danger of stock being lacerated or blemished without detracting from its equal effectiveness with the ordinary rigid wire. When stock come in contact with the sharp points of the barbs they are pricked and warned and the yielding wire permits retreat without laceration or cutting. Two full twists are given to the wire between each barb, firmly uniting the cables and insuring equal strain on both wires. The barb being wound loosely around the line wire the galvanizing is not broken and the dangers of rusting are greatly reduced, as there is no place for the retention of moisture, this point contributing to the longer life of the wire. The barb wire is made of two No. 12½ or No. 12 galvanized soft Bessemer steel wires, twisted together with barbs 3½ in. apart. It is stated that it will stand a breaking strain of 1368 lb. The wire is put up in 80-rod spools and sold by the spool.



The Carroll Yielding Barb Wire.

Russwin Unit Lock.

The Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers street, New York, is now marketing its Russwin unit lock, the accompanying illustrations involving similar mechanical principles, but showing some of the various styles and designs of knobs and escutcheons, of which innumerable finishes can be made. An exceedingly important advantage of the unit lock principle is that all parts of it are connected and tested by expert workmen at the factory, and can in turn be applied by the carpenter to a door without the necessity of altering any adjustment other than that of the knob. This simple operation is accomplished by turning backward or forward, according to thickness of door, a knurled sleeve on the threaded spindle and then locking securely by means of a small lever or wire rod furnished. Some of the important features of this patented lock are, first, the method of reversing, no part of the lock mechanism having to be disturbed to change the hand. The two parts are merely separated, the outside knob containing the cylinder turned right side up and the two plates joined again, this procedure greatly facilitating the quick application of lock to door. The latch action has been arranged so as largely to eliminate friction of the long nosed swinging type. The latch head is actuated by a high grade phosphor bronze spring bearing on two steel rollers, and at the point of contact between the latch tail and the finger on the side there is also a steel roller. The latch slide is actuated by another phosphor bronze spring. The two springs exert a strong tension on the knob and an easy pressure on the latch, now so universally desired in high grade locks. Both inside and outside knobs are seamless solid bronze castings and are screwless, being firmly attached to the lock plates. They are finely fitted and supported in long bearings, and a very short turn in either direction retracts the latch bolt. The stop which deadlocks the outer knob is on the face of the lock, where people have become accustomed to look for such a device, locking directly into the outside roll back, which in turn holds the outer knob. Both the stop slide and outside roll back are carried by the inner plate. If by chance the outer knob were displaced the door would still be firmly locked, as then there would be merely a disconnection between the knob shank and roll back, which would not affect the locking mechanism. There are three roll backs in the lock—one carried by the inner knob, one for the cylinder spindle and one for the outer knob. They are kept in perfect alignment by a system of pivoting one in the other. In providing separate roll backs for the different actuating elements of the lock the carrying of superfluous metal is eliminated, creating an action which is smooth, well balanced and pleasing to the touch. The locking mechanism is all carried by the inside plate where it is least accessible from the outside of the door. The outer plate acts merely as an aligning and supporting element for the outer knob. The two plates are firmly joined together by machine screws. The dead bolt can be thrown from the inside by the T piece. One turn of the key from the outside retracts it, and a further half turn will retract the latch bolt. One turn of the key in the opposite direction will also throw the bolt from the outside. The working parts are all made of hard rolled sheet brass, a construction which has heretofore been confined almost exclusively to high grade Government locks. The different parts working with but slight friction are said to be practically indestructible. As a whole, the lock can be easily fitted, will work properly when applied, and has an action which, it is believed, will please the most critical. Russwin unit locks



Types of Russwin Unit Locks.

are made in both horizontal and upright types, and are furnished in all schools of designs.

The Armitage Fruit Jar Holder.

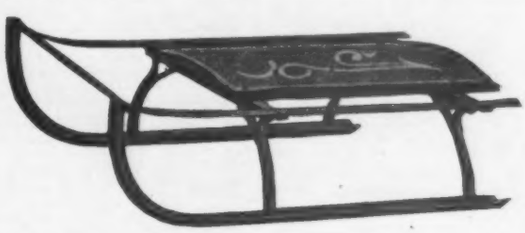
Republic Supply Company, P. O. Box 333, Pittsburgh, Pa., is offering the fruit jar holder shown herewith. It consists of a clamp and shank of malleable iron, with an elliptical bracket to which is fastened a steel band. The band passes around the jar and is fastened by means

The Armitage Fruit Jar Holder.

of a link and hook attachment to a cam lever. After the jar is set in position the band is drawn around it and the connecting link, which is hinged to the cam lever, is drawn over, holding the jar firmly in place. The steel band is lined with corrugated rubber, which takes firm hold on the jar, and at the same time forms a cushion to prevent the jar breaking from pressure. To allow for a slight difference in the diameter of jars the band can be shifted either way ½ in. by means of an adjusting screw. The band is fitted with two hooks, by which it can be lengthened to hold either pint or quart jars. It is pointed out that after the jar is placed in position and clamped it is held firmly without being supported in any way by the hand; that in preserving fruit the holder prevents the hands being burned by hot jars, and overcomes all danger of slipping from the hands; that when sealing the jar it is only necessary to screw on the cap and tighten it with the wrench, which accompanies each holder and which can be easily done with one hand; and that no cap can become so tight that it cannot be easily unscrewed with the jar holder and wrench combined.

The Wagner Steel Sleds.

The steel sled herewith illustrated represents the new line of sleds and coasters which is being placed on the market by the Wagner Mfg. Company, Cedar Falls, Iowa. The line comprises eight different patterns and 18 different numbers. The particular points of advantage

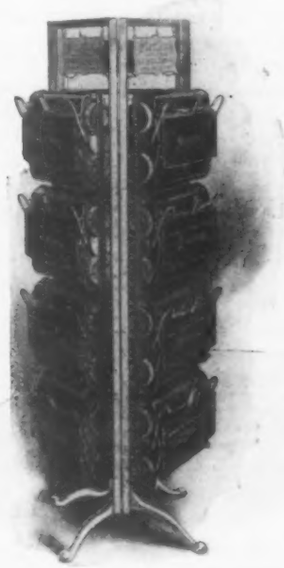


The Wagner Steel Sleds.

claimed by the manufacturer are, first, a T-shaped rounded bottom steel runner and half circle benches or knees, the latter being so constructed that the circle of the outer support braces against the circle of the inner bow shaped support, the two being securely riveted to an L-shaped steel beam, or top cross piece, to give the greatest possible strength at the place where strength is required on the sled. The runners are made of rounded bottom T-steel, to insure speed and easy running. The braces come down, one on each side of the runner, and are riveted through its upper part. The runner is therefore rigidly held in place in being braced on each side, and this form of construction obviates the use of rivets on the rounded bottom, the heads of which would be liable to catch snow and ice or form some other sort of obstruction. In addition to being well made, the sleds are handsomely decorated and of pleasing design.

Sterling Carpet Sweeper Display Stand.

The Streator Metal Stamping Company, Streator, Ill., is offering the sweeper display stand shown in the accompanying illustration. It is triangular in shape, making the sides readily accessible. The stand is of steel construction throughout, handsomely finished in aluminum, with nickel plated signs hanging in the frame over the sweepers. It will hold 12 sweepers, is self-supporting and



Sterling Carpet Sweeper Display Stand.

requires little space. When requested the company will include this stand gratis with the first order for two dozen Sterling sweepers, assorted models, to be shipped at one time.

One-Piece Wire Basket.

The Andrews Wire & Iron Works, Rockford, Ill., is placing on the market the wire basket shown herewith. It is made in two sizes ½ bushel and bushel, the latter being the one illustrated, which is made of 1-in. mesh

One-Piece Wire Basket.

cloth, all in one piece, No. 13 wire being used. The top ring is No. 4 wire, and the bottom ring and frame wire No. 6. The basket is supplied with two side drop handles, fitted with pail roll grips. The whole basket is galvanized after it is made, to unite all the wires and protect them against action of the atmosphere.

The Ideal Auto-Car.

The La Fayette Fence & Machine Company, La Fayette, Ind., is offering the auto-car shown herewith. The metallic wheels have rubber tires and malleable castings are used throughout in construction. The car has two independent levers and can be operated with one or two hands at will. The gearing is so constructed that it is

The Ideal Auto-Car.

impossible to get the car on a dead center, and the car can be started in any position by the levers. The front wheels are 10 in. and the back wheels 16 in., both having ¾-in. rubber tires. The point is made that a child can maintain an erect position and can operate the car with ease. It is made in two styles, one and two passenger, artistically painted with two coats of paint.

Lyman Receiver Sights.

The Lyman Gun Sight Corporation, Middlefield, Conn., is offering the receiver sights shown herewith. With

Fig. 1.—Lyman Windgauge Receiver Sight.

the wind gauge receiver sight, illustrated in Fig. 1, a paper templet is sent, marked for drilling the holes. After tapping holes for attaching the sight it is secured by screws. In Figs. 2 and 3 are shown receiver and wind gauge receiver sights for Remington-Lee sporting

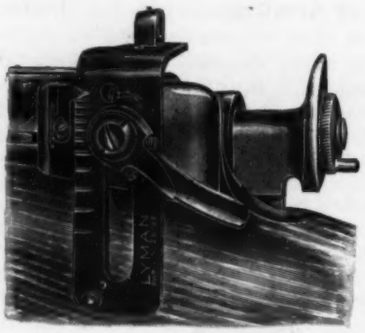


Fig. 2.—Lyman Receiver Sight for Remington-Lee Sporting Rifle.

rifles. These are attached firmly to the frame of the rifle with two screws. The sight is elevated by turning the thumb lever up and then locked by turning it down. When it is desired to tighten or change the position of

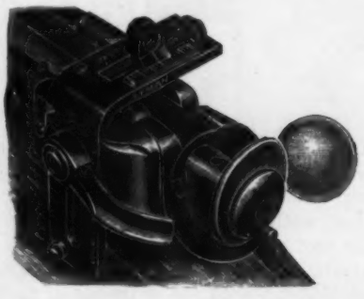


Fig. 3.—Lyman Windgauge Receiver Sight for Remington-Lee Sporting Rifle.

the lever this is done by loosening the two small adjusting screws in the lever and turning the fluted nut on the stud.

The Reubens Hardware Company is the title of a new Hardware firm at Reubens, Idaho. Reubens is a new town, just plotted.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	38 @39
City, Boiled	.. @..
State and Western, raw	37 @38
Raw Calcutta Seed	68 @..
Lard, Extra Prime, Winter	70 @71
Extra No. 1	54 @56
No. 1	41 @43
Cotton-seed, Crude, f.o.b. mills	@..
Summer Yellow, Prime	38 @38¼
Summer Yellow, off grades	@..
Sperm, Crude	53 @..
Natural Spring	@..
Bleached Spring	@..
Natural Winter	63 @65
Bleached Winter	66 @67
Bleached Winter, Extra	68 @69
Tallow, Prime	51 @53
Whale, Crude	32 @33
Natural Winter	43 @44
Bleached Winter	45 @46
Extra Bleached Winter	47 @48
Menhaden, Brown, Strained	26 @29
Light, Strained	27 @30
Bleached, Winter	@..
Extra Bleached, Winter	@..
Southern	@..
Cocoanut, Ceylon	₱ lb .. @ 7½
Cochin	₱ lb 8¼@ 8½
Cod, Domestic, Prime	30 @33
Newfoundland	35 @37
Red, Elaine	36 @39
Red, Saponified	₱ lb 4¾@ 5
Olive, Italian, bbls	56 @60
Neatsfoot, Prime	48 @49
Palm, Logos	₱ lb 6 @..

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₱ gal. 10¼@11¼
29 gravity, 15 cold test	11¼@12¼
Summer	10¼@11½
Cylinder, light filtered	18 @19
Dark filtered	16 @17
Paraffine, 903-907 gravity	13¼@14
903 gravity	12½@13
883 gravity	10¼@10¾
Red	12½@14

In small lots ½¢ advance.

Miscellaneous—

Barytes:		
White, Foreign	₱ ton	$17.50@19.00
Amer. floated	₱ ton	19.00@.....
Off color, No. 2	₱ ton	13.50@15.00
Chalk, in bulk	₱ ton	3.00@ 3.25
In bbls	₱ 100 lb	....@ .35
China Clay, English	₱ ton	11.00@17.00
Cobalt, Oxide	₱ 100 lb	2.50@ 2.60
Whiting, Common	₱ 100 lb	.43@ .48
Gilders	₱ 100 lb	.50@ .55
Ex. Gilders	₱ 100 lb	.55@ .60

Putty, Commercial—₱ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₱ gal.

In Oil bbls	59½@60
In machine bbls	60 @60½

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	43 @47
Bone Dried	53 @57
Button	49 @50
Diamond I	54 @55
Fine Orange	50 @52
A. C. Garnet	@40
D. C	38 @60
Octagon B	@52
T. N	47 @48
V. S. O	@55

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	12 @16
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
In Barrels	@ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½

Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Lead, White, Dry, in bbls	@ 6¾
Zinc, American, dry	5¾@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¼
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13¼
Lots of less than 1 ton	12¾@13¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@11¾
Lots of less than 1 ton	11¾@12¾

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	8 @10
Black Drop, American	4 @ 6
Black Drop, English	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.10@3.20
Green, Chrome, ordinary	5½@ 6
Green, Chrome, pure	17 @25

Lead, Red, bbls., ½ bbls. and kegs:

Lots 500 lb or over	@ 7¼
Lots less than 500 lb	@ 7¾
Litharge, American, bbls	@ 7¼
Ocher, American	₱ ton $8.50@16.00
American Golden	2½@ 3½
French	1¾@ 2½
Foreign Golden	3 @ 4
Orange Mineral, English	10 @12
French	10¾@12
German	8½@10
American	8½@ 8¾
Red, Indian, English	4½@ 8½
American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $1.50@1.25
English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Italian, Raw, Powdered	3 @ 6½
American, Raw	1½@ 2
American Burnt and Pow	1½@ 2
Talc, French	₱ ton $17.00@25.00
American	₱ ton 17.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
English	₱ 100 lb 80 @1.00
American	₱ 100 lb, No. 1, 75 @80
American	₱ 100 lb, No. 2, 60 @65
Umber, Turkey, Bnt. & Pow	2¼@ 3¼
Turkey, Raw and Powdered	2½@ 3½
Burnt, American	1½@ 2
Raw, American	1½@ 2
Yellow Chrome	12 @14
Vermilion, American Lead	10 @25
Quicksilver, bulk	65 @..
Quicksilver, bags	@60
English, Import	65 @70
Chinese	$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ₩ doz. $3.00 ..... 33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent 35%
Taplin's Perfection 35%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils ..... ₩ lb 6¾@7 ¢
Hay-Budden, Wrought ..... 9@9¼ ¢
Horseshoe brand, Wrought ..... 9@9¼ ¢
Trenton ..... ₩ lb 9@9¼ ¢

Imported—
Peter Wright & Sons, ₩ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½ ¢.

Anvil, Vise and Drill—
Millers Falls Co., $18.00 ..... 15&10%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co. 33⅓%

Augers and Bits—
Com. Double Spur ..... 75@75&5%
Jennings' Patn., reg. finish ..... 50&10@60%
Black Lip or Blued ..... 60&10%
Boring Mach. Augers ..... 70&10%
Car Bits, 12-in. twist ..... 50&10%
Ford's Auger and Car Bits ..... 40&5%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list 25%
No. 30, R. Jennings' list ..... 40&7½%
Russell Jennings' ..... 25&10&2½%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45%
Millers Falls ..... 50&10&7½%
Pugh's Black 20%
Pugh's Jennings' Pattern 35%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 40%
Snell's Car Bits, 12-in. twist ..... 60&10%
Wright's Jennings' Bits 50%

Bit Stock Drills—See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26 ..... 50&10%
Clark's Pattern, No. 1, ₩ doz. $26; No. 2, $18 ..... 65%
Ford's, Clark's Pattern ..... 60&5%
C. E. Jennings & Co., Steer's Pat. 25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut ..... $3.00@3.25
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $6.75

Hollow Augers—
Bonney Pat., per doz. ..... $5.50@6.00
Ames ..... 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—
Ship Augers ..... 45&5@—%
Ford's ..... 33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' ..... 35&5%
Snell's 40%

Awl Hafts—See *Handles, Mechanics' Tool.*

Awls—
Brad Awls:
Handled ..... gro. $2.75@3.00
Unhdled, Shldered ..... gro. 63@66¢
Unhandled, Patent ..... gro. 66@70¢
Peg Awls:
Unhandled, Patent ..... gro. 31@34¢
Unhdled, Shldered ..... gro. 65@70¢
Scratch Awls:
Handled, Com ..... gro. $3.50@4.00
Handled, Socket ..... gro. $11.50@12.00
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights:
First Quality ..... $4.75@5.00
Second Quality ..... $4.25@4.50
Double Bit, base weights:
First Quality ..... $7.00@7.50
Second Quality ..... $6.50@6.75

Axle Grease—See *Grease, Axle*

Axles—Iron or Steel
Concord, Loose Collar ..... 1¼@1¾ ¢
Concord, Solid Collar ..... 1¾@1¾ ¢
No. 1 Common, Loose ..... 3¼@3¾ ¢
No. 1½ Com., New Style ..... 3¾@4¼ ¢
No. 2 Solid Collar ..... 4@4½ ¢
Half Patent:
Nos. 7, 8, 11 and 12 ..... 75@75&5%
Nos. 13 to 14 ..... 70&10@75&5%
Nos. 15 to 18 ..... 75&10@75&10&5%
Nos. 19 to 22 ..... 75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb. ..... 1½@5¢
Common and Concord, turned. lb. ..... 5½@6¢
Half Patent ..... lb. 8½@9¢

Bait—Fishing—
Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances—Sash—
Caldwell new list 50%
Pullman ..... 50&10@60%

Spring—
Spring Balances ..... 50&10@60%
Chatillon's:
Light Spg. Balances ..... 50&10%
Straight Balances ..... 40@50%
Circular Balances ..... 50&10%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars—Crow—
Steel Crowbars, 10 to 40 lb ..... per lb., 3¼¢

Towel—
No. 10 Ideal, Nickel Plate ..₩ gro. $8.50

Beams, Scale—
Scale Beams ..... 40&10@50%
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ₩ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ₩ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized ..₩ doz. $1.75
Western W. G. Co.:
No. 1 Electric ..... ₩ gro. $7.80
No. 2 Buffalo ..... ₩ gro. $9.00
No. 3 Perfection Dust ..... ₩ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, per doz., No. 1, Jap'd, $1.20; No. 1, Tin'd, $1.50; No. B, Jap'd, $2.00; No. 2, Tin'd, $2.25.
Lyon, Jap'd, per doz., No. 2, $1.25; No. 3, $1.50.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover $6.00
Western, W. G. Co., Buffalo $7.00
Wonder (R. M. Co.) ..₩ gro. net, $6.00

Bellows—
Blacksmith, Standard List ..... 60&10@60&10&5%

Hand—
Inch	6	7	8	9	10
Doz	$4.75	5.70	6.65	7.60	8.55

Molders—
Inch	9	10	11	12	14
Doz	$8.00	9.00	10.50	12.50	14.50

Net Prices.

Bells—Cow—
Ordinary quality ..... 70@70&5%
High grade ..... 70&10@70&10&5%
Jersey ..... 75&10%
Texas Star 50%

Door—
Abbe's Gong 45%
Burton Gong 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%
Trip Gong ..... 50&10@50&10&5%
Yankee Gong 55%

Hand—
Hand Bells, Polished, Brass ..... 60&10%
White Metal 60%
Nickel Plated ..... 50&10&60%
Swiss ..... 60@60&7½%
Cone's Globe Hand Bells ..... 33⅓@35%
Silver Chime ..... 33⅓@35%

Miscellaneous—
Farm Bells ..... lb. 8¼¢
Steel Alloy Church and School ..... 50&10@60%
American Tube & Stamping Co. Gongs 45%
Table 'Call Bells ..... 50@50&10%

Belting—Leather—
Extra Heavy, Short Lap ..... 60&5%
Regular Short Lap ..... 60&10&5%
Standard 70%
Light Standard ..... 70&5%
Cut Leather Lacing 50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—
Agricultural (Low Grade) ..... 75@75&5%
Common Standard ..... 70@70&10%
Standard ..... 60&5@60&10%
Extra ..... 60@60&5%
High Grade ..... 50&5@50&10%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender 40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—
John S. Leng's Son's 1906 list:
Chain, Parts, Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks—Tackle—
Common Wooden ..... 70&10@75%
Hartz St. Tackle Blocks ..... 50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty Mal. Iron ..... 50&10%
Stowell's Self Loading 60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c 40%
Paper Embossed ..... 40&10%

Boards, Wash—See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co. 33⅓%

Bolts—Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ × 6 and smaller ..... 75@—%
Larger and Longer ..... 65&5@—%
Phila. Eagle $3.90 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95 ..... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer .. 65&5@—%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch	3	4	5	6	8
Per doz	$0.90	.35	.45	.60	.80

Cast Iron Spring Foot, Jap'd:
Inch	6	8	10
Per doz	$1.20	1.50	2.25

Cast Iron Chain, Flat, Japanned:
Inch	6	8	10
Per doz	$1.00	1.40	1.85

Cast Iron Flat Shutter, Jap'd., Brass Knobs:
Inch	6	8	10
Per doz	$0.75	.95	1.25

Wrought Barrel Japd. 80@80&10%
Barrel Bronzed ..... 50@50&10%
Spring ..... 70&10@70&10&10%
Shutter ..... 50&5@50&10&5%
Square Neck ..... 75@75&10%
Square ... 66⅔&10@66⅔&10&10%
Ives' Patent Door 60%

Plow and Stove—
Plow ..... 65&10@—
Stove ..... 87½&10@—

Tire—
Common Iron 80%
Norway Iron 80%
American Screw Company:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Bay State, list Dec. 28, '99 ..... 80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Eclipse, list Dec. 28, '99 ..... 80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84 ... 80%
Eagle Phila., list Oct. 16, '84 ... 82½%
Mount Carmel, list Dec. 28, '99 ... 80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 23, '99 ..... 80%
Norway Phila., list Oct., '84 ..... 80%
Upson Nut Co.:
Tire Bolts 75%

Borers, Tap—
Borers Tap, Ring, with Handle:
Inch	1¼	1½	1¾	2
Per doz	$4.80	5.60	6.40	8.00
Inch	2¼	2½		
Per doz	$6.65	11.50		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each ... 25%

Boxes, Mitre—
C. E. Jennings & Co. 30%
Langdon ..... 15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.: Nos. 210 to 460, 30%; Nos. 50 and 60 ..... 35%

Braces—
Common Ball, American ..... $1.25@1.30
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 ..... 60%
C. E. Jennings & Co. ..... 50&5%
Mayhew's Ratchet 60%
Mayhew's Quick Action Hay Pat. 50%
Millers Falls Drill Braces ..... 25&10%
P., S. & W. Co., Peck's Pat. 60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor 45%

Brackets—
Wrought Steel ..... 80&10@80&10&5%
Griffin's Pressed Steel ..... 80@80&10%
Griffin's Folding Brackets ..... 70&10%
Stowell's Cast Shelf, 75%; Sink 50%
Western, W. G. Co., Wire ..... 60&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co. ..... 75&20%
Western, W. G. Co. 80%
Wire Goods Co. ..... 75@75&10%

Buckets, Galvanized—
Price per dozen.
Quart	10	12	14
Water, Regular	1.50	1.70	1.90
Water, Heavy	3.40	3.70	3.80
Fire, Rd. Bottom	2.30	2.55	2.95
Well	2.55	2.87	3.15

Bucks, Saw—
Hoosier ..... ₩ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts—Brass—
Wrought, list, Sept., '96 ..... 15@—%
Cast Brass, Tiebout's 50%

Cast Iron—
Fast Joint, Broad ..... 40&10@50%
Fast Joint, Narrow ..... 40&10@50%
Loose Joint ..... 70&10@75%
Loose Pin ..... 70&10@75%
Mayer's Hinges ..... 70@70&5
Parliament Butts ..... 70@70&5

Wrought Steel—
	Discount.
Reversible and Broad	75&5%
Light Reversible, Light Narrow	75&10%
Loose Joint, Narrow, L'ht Inside Blind, etc	75%
Back Flaps, Table, Chest	70&10%

Extra Discount.

Cages, Bird—
Hendryx Brass: Series 3000, 5000, 1100, 5%; 1200, 33⅓%; 200, 300, 600, 900 ..... 40&10%
Hendryx Bronze: Series 700, 900 ..... 40&10%
Hendryx Enameled ..... 40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—
Blunt, 1 prong ..... per lb. 4@4¼ ¢
Sharp, 1 prong ..... per lb., 3¼@3¾ ¢
Burke's Blunt, 4@4¼ ¢; Sharp, 4½@4¾ ¢

The Ideal Auto-Car.

The La Fayette Fence & Machine Company, La Fayette, Ind., is offering the auto-car shown herewith. The metallic wheels have rubber tires and malleable castings are used throughout in construction. The car has two independent levers and can be operated with one or two hands at will. The gearing is so constructed that it is

The Ideal Auto-Car.

impossible to get the car on a dead center, and the car can be started in any position by the levers. The front wheels are 10 in. and the back wheels 16 in., both having ¾-in. rubber tires. The point is made that a child can maintain an erect position and can operate the car with ease. It is made in two styles, one and two passenger, artistically painted with two coats of paint.

Lyman Receiver Sights.

The Lyman Gun Sight Corporation, Middlefield, Conn., is offering the receiver sights shown herewith. With

Fig. 1.—Lyman Windgauge Receiver Sight.

the wind gauge receiver sight, illustrated in Fig. 1, a paper templet is sent, marked for drilling the holes. After tapping holes for attaching the sight it is secured by screws. In Figs. 2 and 3 are shown receiver and wind gauge receiver sights for Remington-Lee sporting

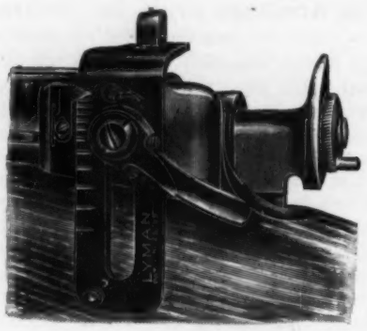


Fig. 2.—Lyman Receiver Sight for Remington-Lee Sporting Rifle.

rifles. These are attached firmly to the frame of the rifle with two screws. The sight is elevated by turning the thumb lever up and then locked by turning it down. When it is desired to tighten or change the position of

Fig. 3.—Lyman Windgauge Receiver Sight for Remington-Lee Sporting Rifle.

the lever this is done by loosening the two small adjusting screws in the lever and turning the fluted nut on the stud.

The Reubens Hardware Company is the title of a new Hardware firm at Reubens, Idaho. Reubens is a new town, just plotted.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Linseed, City, raw	.38 @39
City, Boiled	.. @..
State and Western, raw	.37 @38
Raw Calcutta Seed	.68 @..
Lard, Extra Prime, Winter	.70 @71
Extra No. 1	.54 @56
No. 1	.41 @43
Cotton-seed, Crude, f.o.b. mills	.. @..
Summer Yellow, Prime	.38 @38½
Summer Yellow, off grades	.. @..
Sperm, Crude	.53 @..
Natural Spring	.. @..
Bleached Spring	.. @..
Natural Winter	.63 @65
Bleached Winter	.66 @67
Bleached Winter, Extra	.68 @69
Tallow, Prime	.51 @53
Whale, Crude	.32 @33
Natural Winter	.43 @44
Bleached Winter	.45 @46
Extra Bleached Winter	.47 @48
Menhaden, Brown, Strained	.26 @29
Light, Strained	.27 @30
Bleached, Winter	.. @..
Extra Bleached, Winter	.. @..
Southern	.. @..
Cocoanut, Ceylon	₩ lb .. @ 7¼
Cochin	₩ lb 8¼@ 8½
Cod, Domestic, Prime	.30 @33
Newfoundland	.35 @37
Red, Elaine	.36 @39
Red, Saponified	₩ lb 4¾@ 5
Olive, Italian, bbls	.56 @60
Neatsfoot, Prime	.48 @49
Palm, Logos	₩ lb 6 @..

Mineral Oils—

Black, 29 gravity, 25@30 cold test	₩ gal. 10½@11½
29 gravity, 15 cold test	11½@12½
Summer	10½@11½
Cylinder, light filtered	.18 @19
Dark filtered	.16 @17
Paraffine, 903-907 gravity	13½@14
903 gravity	12½@13
883 gravity	10¼@10¾
Red	12½@14

In small lots ½¢ advance.

Miscellaneous—

Barytes:	
White, Foreign	₩ ton $17.50@19.00
Amer. floated	₩ ton 19.00@.....
Off color, No. 2	₩ ton 13.50@15.00
Chalk, in bulk	₩ ton 3.00@ 3.25
In bbls	₩ 100 lb ....@ .35
China Clay, English	₩ ton 11.00@17.00
Cobalt, Oxide	₩ 100 lb 2.50@ 2.60
Whiting, Common	₩ 100 lb .43@ .48
Gilders	₩ 100 lb .50@ .55
Ex. Gilders	₩ 100 lb .55@ .60

Putty, Commercial—₩ 100 lb

In bladders	$1.70 @1.85
In bbls. or tubs	1.20 @1.40
In 1 lb to 5 lb cans	2.65 @2.95
In 12½ to 50 lb cans	1.50 @1.90

Spirits Turpentine—₩ gal.

In Oil bbls	59½@60
In machine bbls	60 @60½

Glue—

Cabinet	₩ lb .11 @15
Common Bone	.7 @ 9
Extra White	.18 @24
Foot Stock, White	.11 @14
Foot Stock, Brown	.8 @11
German Hide	.12 @18
French	.10 @40
Irish	.13 @16
Low Grade	.9 @12
Medium White	.14 @17

Gum Shellac—

Bleached Commercial	₩ lb .43 @47
Bone Dried	.53 @57
Button	.40 @50
Diamond I	.54 @55
Fine Orange	.50 @52
A. C. Garnet	.. @40
D. C.	.58 @60
Octagon B	.. @62
T. N.	.47 @48
V. S. O.	.. @55

Colors in Oil—

Black, Lampblack	₩ lb .12 @14
Blue, Chinese	.36 @46
Blue, Prussian	.32 @36
Blue, Ultramarine	.13 @16
Brown, Vandyke	.11 @14
Green, Chrome	.12 @16
Green, Paris	.. @24
Sienna, Raw	.12 @15
Sienna, Burnt	.12 @15
Umber, Raw	.11 @14
Umber, Burnt	.11 @14

White Lead, Zinc, &c.—

Lead, English white, in Oil	₩ lb 9½@ 9¾
Lead, American white, in Oil:	
Lots of 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
In Barrels	.. @ 6¾
Lead, White, in oil, 25 lb tin pails, add to keg price	.. @ ⅛
Lead, White, in oil, 12½ lb tin pails, add to keg price	.. @ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	.. @ 1¼
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	₩ lb
Lead, White, Dry, in bbls	.. @ 6¾
Zinc, American, dry	5¾@ 5½
Zinc, French:	
Antwerp, Red Seal, dry	8¾
Antwerp, Green Seal, dry	10¼
Paris, Red Seal, dry	9¼
Paris, Green Seal, dry	10½
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over	12¾@13¼
Lots of less than 1 ton	12¾@13¾
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over	11¾@11¾
Lots of less than 1 ton	11¾@12¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

Black, Carbon	₩ lb .5 @10
Black Drop, American	.4 @ 6
Black Drop, English	.5 @15
Black, Ivory	.16 @20
Lamp, Com	.4½@ 6
Blue, Celestial	.4 @ 6
Blue, Chinese	.29 @32
Blue, Prussian	.27 @30
Blue, Ultramarine	.4½@15
Brown, Spanish	.½@ 1
Carmine, No. 40	.$3.10@3.20
Green, Chrome, ordinary	.3½@ 6
Green, Chrome, pure	.17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	.. @ 7¼
Lots less than 500 lb	.. @ 7¾
Litharge, American, bbls	.. @ 7¼
Ocher, American	₩ ton $8.50@16.00
American Golden	.2½@ 3½
French	.1¼@ 2½
Foreign Golden	.3 @ 4
Orange Mineral, English	.10 @12
French	.10¾@12
German	.8½@10
American	.8½@ 8¾
Red, Indian, English	.4½@ 8½
American	.3 @ 3¼
Red, Turkey, English	.4 @10
Red, Tuscan, English	.7 @10
Red, Venetian, Amer.	₩ 100 lb $1.50@1.25
English	.100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	.3 @ 9½
Italian, Raw, Powdered	.3 @ 6½
American, Raw	.1½@ 2
American Burnt and Pow	.1½@ 2
Talc, French	₩ ton $17.00@25.00
American	₩ ton 17.00@25.00
Terra Alba, French	₩ 100 lb 90 @1.00
English	₩ 100 lb 80 @1.00
American	₩ 100 lb, No. 1, 75 @80
American	₩ 100 lb, No. 2, 60 @65
Umber, Turkey, Bnt. & Pow	.2¼@ 3½
Turkey, Raw and Powdered	.2½@ 3½
Burnt, American	.1½@ 2
Raw, American	.1½@ 2
Yellow Chrome	.12 @14
Vermilion, American Lead	.10 @25
Quicksilver, bulk	.65 @..
Quicksilver, bags	.. @68
English, Import	.65 @70
Chinese	.$0.90@1.00

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—

Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....℔ lb 6¾@7 ¢
Hay-Budden, Wrought.....9@9¼ ¢
Horseshoe brand, Wrought.....9@9¼ ¢
Trenton .....℔ lb 9@9¼ ¢

Imported—

Peter Wright & Sons, ℔ lb, 84 to 349 lb, 11¢; 350 to 600 lb, 11½¢.

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Livingston Nail Co.....33⅓%

Augers and Bits—

Com. Double Spur.....75@75&5%
Jennings' Patn., reg. finish....50&10@60%
Black Lip or Blued.....60&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....65%
Millers Falls.....50&10&7½%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....25%
Snell's Auger Bits.....40%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills— See *Drills, Twist.*

Expansive Bits—

Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $36; No. 2, $18.....65%
Ford's, Clark's Pattern.....60&5%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—

Per gro.
Common Dble. Cut....$3.00@3.85
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—

Bonney Pat., per doz..$5.50@6.00
Ames .....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—

Ship Augers.....45&5@—%
Ford's .....33⅓&5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Snell's 40%

Awl Hafts— See *Handles, Mechanics' Tool.*

Awls—

Brad Awls:
Handled .....gro. $2.75@3.00
Unhdled, Shldered...gro.63@66¢
Unhandled, Patent..gro.66@70¢
Peg Awls:
Unhandled, Patent..gro. $1@2¼¢
Unhdled, Shldered..gro. 65@70¢
Scratch Awls:
Handled, Com...gro. $3.50@4.00
Handled, Socket..gro.$11.50@12.00
Hurwood 40%

Awl and Tool Sets— See *Sets, Awl and Tool.*

Axes—

Single Bit, base weights:
First Quality.....$4.75@5.00
Second Quality.....$4.25@4.50
Double Bit, base weights:
First Quality.....$7.00@7.50
Second Quality.....$6.50@6.75

Axle Grease— See *Grease, Axle*

Axles— *Iron or Steel*

Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
No. 1½ Com., New Style3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Half Patent:
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18...75&10@75&10&5%
Nos. 19 to 22...75&10@75&10&5%

Boxes, Axle—

Common and Concord, not turned lb..4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....lb. 6½@7¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—

Caldwell new list.....50%
Pullman .....50&10@60%

Spring—

Spring Balances.....50&10@60%
Chatillon's:
Light Spg. Balances.....50&10%
Straight Balances.....40@50%
Circular Balances.....50&10%
Large Dial.....30%

Barb Wire— See *Wire, Barb.*

Bars— Crow—

Steel Crowbars, 10 to 40 lb.... per lb., 3¼¢

Towel -

No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—

Scale Beams.....40&10@50%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 1, Jap'd, $1.29; No. 1, Tin'd, $1.50; No. B, Jap'd, $2.00; No. 2, Tin'd, $2.25.
Lyon, Jap'd, per doz., No. 2, $1.25; No. 3, $1.50.
Taplin Mfg. Co.:
Improved Dover, per gro., No. 60, $6.00; No. 75, $6.50; No. 100, $7.00; No. 102, Tin'd, $8.50; No. 150, Hotel, $15.00; No. 152, Hotel Tin'd, $17.00; No. 200, Tumbler, $8.50; No. 202, Tumbler Tin'd, $9.50; No. 300, Mammoth, per doz., $25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....$6.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (B. M. Co.)..℔ gro. net, $8.00

Bellows—

Blacksmith, Standard List.. 60&10@60&10&5%

Hand—

Inch..	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.75*	*5.70*	*6.65*	*7.60*	*8.85*

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*
Doz...	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Net Prices.

Bells— Cow—

Ordinary goods.....70@70&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—

Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—

Hand Bells, Polished, Brass.60&10%
White Metal.....60%
Nickel Plated.....50&10&60%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—

Farm Bells.....lb. 8½¢
Steel Alloy Church and School 50&10@60%
American Tube & Stamping Co. Gongs 45%
Table Call Bells.....50@50&10%

Belting— Leather—

Extra Heavy, Short Lap..60&5%
Regular Short Lap....60&10&5%
Standard 70%
Light Standard.....70&5%
Cut Leather Lacing.....50%
Leather Lacing Sides, per sq. ft. 25¢

Rubber—

Agricultural (Low Grade).....75@75&5%
Common Standard....70@70&10%
Standard .....60&5@60&10%
Extra .....60@60&5%
High Grade.....50&5@50&10%

Bench Stops— See *Stops, Bench*

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.
Green River Tire Benders and Upsetters 20%

Bicycle Goods—

John S. Leng's Son's 1906 list:
Chain, Parts, Spokes.....50%
Tubes 60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—

Common Wooden.....70&10@75%
Hartz St. Tackle Blocks.....50@50&5%
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse Steel, 75%; Hollow Steel, 50&10%; Star Wire Rope, 50%; Tarbox Metal Snatch, 50%; Tarbox New Style Steel, 50&10%; Wire Rope Snatch, 50%.
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron...50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper Embossed.....40&10%

Boards, Wash— See *Washboards.*

Bobs, Plumb—

Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—

Common Carriage (cut thread): ⅜ × 6 and smaller.....75@—%
Larger and Longer..65&5@—%
Phila. Eagle $3.00 list May 21, '99 80%
Bolt Ends, list Feb. 14, '95.... 65&10@—%
Machine, ⅜ x 4 and smaller 75@—%
Machine, larger and longer.. 65&5@—%

Door and Shutter—

Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.60*	*.80*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.20*	*1.50*	*2.25*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.40*	*1.65*

Cast Iron Flat Shutter, Jap'd., Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.75*	*.35*	*1.25*

Wrought Barrel Japd..80@80&10%
Barrel Bronzed.....50@50&10%
Spring .....70&10@70&10&10%
Shutter .....50&5@50&10&5%
Square Neck.....75@75&10%
Square ...66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Plow and Stove—

Plow .....65&10@—
Stove .....87½&10@—

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84... 80%
Eagle Phila., list Oct. 16, '84....82½%
Mount Carmel, list Dec. 28, '99...80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84 ....80%
Upson Nut Co.:
Tire Bolts.....75&5%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1⅛*	*1½*	*1⅞*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch	*2¼*	*2½*		
Per doz.....	*$6.65*	*11.50*		

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65@$1.75; No. 3, $2.50 each...25%

Boxes, Mitre—

C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection 40%
Seavey 33⅓%
Stanley R. & L. Co.: Nos. 210 to 460, 30%; Nos. 50 and 60.....35%

Braces—

Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60@60&5%
Stanley R. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel..80&10@80&10&5%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf, 75%; Sink...50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods— See *Wire and Wire Goods.*

Broilers—

Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....75@75&10%

Buckets, Galvanized—

Price per dozen.

	Quart.....	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—

Hoosier.....℔ gro. $36.00

Bull Rings— See *Rings, Bull*

Butts— Brass—

Wrought, list, Sept., '95. 15@—%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad....40&10@50%
Fast Joint, Narrow....40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel— Discount.

Reversible and Broad..75&5%
Light Reversible, Light Narrow .....75&10%
Loose Joint, Narrow, L't Inside Blind, etc....75%
Back Flaps, Table, Chest. .....70&10%

Extra, 10@—%

Cages, Bird—

Hendryx Brass: Series 3000, 5000, 1100, 5%; 1200, 33⅓%; 200, 300, 600, 900 .....40&10%
Hendryx Bronze: Series 700, 900.... 40&10%
Hendryx Enameled.....40&10%

Calipers— See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb. 4@4¼¢
Sharp, 1 prong...per lb., 4¼@4¾¢
Burke's Blunt, 4@4¼¢; Sharp 4½@4¾¢

Gautier, Blunt, 4@4¼¢; Sharp 4½@4¾¢
Perkins', Blunt, ℔ lb, 3.65¢; Sharp, 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B. ..... 52@55¢
G. D. ..... *per M* 34@35¢
F. L. ..... *per M* 40@42¢
G. E. ..... *per M* 48@50¢
Musket ..... *per M* 62@63¢

Primers—

Berdan Primers, $2 per M ... 80%
B. L. Caps (Sturtevant Shells) $2 per M ... 20%
All other primers per M. $1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50 ... 10&5%
38 C. F., $7.00 ... 10&5%
22 cal. Rim, $1.50 ... 10&5%
32 cal. Rim, $2.75 ... 10&5%
B. B. Caps, Con. Ball, Swgd. $1.90
B. B. Caps, Round Ball ... $1.49
Central Fire ... 25%
Target and Sporting Rifle .. 15&5%
Primed Shells and Bullets .15&10%
Rim Fire, Sporting ... 50%
Rim Fire, Military ... 15&5%

Casters—

Bed ... 70@70&10%
Plate ... 60&10@60&10&5%
Philadelphia ... 75@75&10%
Acme, Ball Bearing ... 33⅓%
Boss ... 70&10%
Boss Anti-Friction ... 70&10%
Gem (Roller Bearing) ... 60%
Martin's Patent (Phoenix) ... 45%
Standard Ball Bearing ... 45%
Tucker's Patent low list ... 30%
Yale (Double Wheel) low list ... 50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

5-16	⅜	5-16	⅜	7-16	½	9-16
$3.70	3.90	4.95	4.20	4.05	3.95	3.90
⅝	¾	⅞ to 1		1⅛ to 1¼ inch.		
$3.85	3.70	3.65		3.80		

German Coil ... 60&10&10@70%

Halter—

Halter Chains ... 60&5@60&10%
German Pattern Halter Chains, list July 2½, '97 ... 60&10&10%
Covert Mfg. Co. Halter ... 35&5%

Cow Ties—
See *Halters and Ties.*

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, *Str'ght, with ring* .$25.00
6½—6-2, *Str'ght, with ring* .$26.00
6½—8-2, *Str'ght, with ring* .$30.00
6½—10-2, *Str'ght, with ring* .$35.00

NOTE.—Add 2c per pair for Hooks. Twist Traces: add per pair for Nos. 2 and 3, 2c; No. 1, 3c; No. 0, 4c to price of Straight Link.

Eastern Standard Traces, Wagon Chain, &c. ... 60&10%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron ... 60&10%
Brass ... 60&10%
Safety Chain ... 70&10%
Gal. Pump Chain ... *lb.* 4@4½%
Covert Mfg. Co.:
Breast, Halter, Heel, Rein, Stallion ... 40%
Oneida Community:
Am. Dog Leads and Kennel Chains, 40@40&5%
Niagara Dog Leads and Kennel Chains ... 45@60&5%
Wire Goods Co.:
Dog Chain ... 70&10%
Universal Dbl.-Jointed Chain ... 50%

Chain and Ribbon, Sash—

Oneida Community:
Copper Chain, 60&5%; Steel Chain, 60%
Pullman:
Bronze Chain, 60%; Steel Chain, 60&10%
Sash Chain Attachments, per set .8¢
Aluminoy Sash Ribbon, per 100 ft. ... $1.25@$3.00
Sash Ribbon Attachments, per set .8¢

Chalk—(From Jobbers.)

Carpenters' Blue .... gro., 40@—¢
Carpenters' Red .... gro., 35@—¢
Carpenters' White .. gro., 30@—¢
See also Crayons.

Checks, Door—

Bardsley's ... 45%
Pullman, per gro. ... $54.00
Russwin ... 40%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools ... 55%
Youths' Chests, with Tools ... 40%
Gentlemen's Chests, with Tools .30%
Farmers', Carpenters', etc., Chests, with Tools ... 30%
Machinists' and Pipe Fitters' Chests, Empty ... 30%
Tool Cabinets ... 50%
C. E. Jennings & Co.'s Machinists' Tool Chests ... 33⅓&10%

Chisels—
Socket Framing and Firmer

Standard List .. 75&10@75&10&5%
Buck Bros. ... 30%
Charles Buck ... 30%
C. E. Jennings & Co.:
Socket Firmer No. 10 ... 60%
Socket Framing No. 15 ... 60%
Swan's ... 75%
L. & I. J. White ... 30@20&5%
L. & I. J. White, Tanged ... 25&5%

Tanged—

Tanged Firmers ..... 33 1-3@40%
Buck Bros. ... 30%
Charles Buck ... 30%
C. E. Jennings & Co. Nos. 191, 181 .. 25%

Cold—

	lb.
Cold Chisels, good quality	.13@15¢
Cold Chisels, fair quality	.11@12¢
Cold Chisels, ordinary	... 9@10¢

Chucks—

Almond Drill Chucks ... 35%
Almond Turret Six-Tool Chuck ... 35%
Beach Pat., each $8.00 ... 35&5%
Empire ... 25%
Blacksmiths' ... 25%
Jacobs' Drill Chucks ... 35%
Pratt's Positive Drive ... 25%
Skinner Patent Chucks:
Independent Lathe Chucks ... 40&10%
Universal, Reversible Jaws ... 40%
Combination, Reversible Jaws ... 40%
Drill Chucks, New Model, 25%; Standard, 40&10%; Skinner Pat., 25%; Positive Drive ... 33⅓%
Planer Chucks ... 30%
Face Plate Jaws ... 40&10%
Standard Tool Co.:
Improved Drill Chuck ... 45%
Union Mfg. Co.:
Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21 ... 35%
Scroll Combination, Nos. 82 and 84 ... 30%
Geared Scroll, Nos. 33, 34 and 35 .. 35%
Independent Iron, Nos. 18 and 318 .40%
Independent Steel, No. 64 ... 30%
Union Czar Drill, Nos. 000, 101, 103 ... 35%
Universal 11, 12, 16, 17, 13, 14, 15 .. 40%
Universal, No. 42 ... 35%
Iron Face Plate Jaws, Nos. 28, 30, 48 and 50 ... 40%
Steel Face Plate Jaws, Nos. 70 and 72 ... 35%
Westcott Patent Chucks:
Lathe Chucks ... 50%
Little Giant Auxiliary Drill ... 50%
Little Giant Double Grip Drill .. 50%
Little Giant Drill, Improved ... 50%
Oneida Drill ... 50%
Scroll Combination Lathe ... 50%

Clamps—

Adjustable, Hammers' ... 20@20&5%
Carriage Makers', P., S. & W. Co. ... 40&10@50%
Besly, Parallel ... 33⅓&10%
Lineman's, Utica Drop Forge & Tool Co. ... 40%
Wood Workers, Hammers' ... 40&10%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable ... 55%
Iwan's Champion, Stationary ... 45%

Sidewalk—

Star Socket, All Steel, ℔ doz. $4.05 net
Star Shank, All Steel, ℔ doz. $3.24 net
W. & C. Shank, All Steel, ℔ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros. ... 30%
Fayette R. Plumb ... 30%
L. & I. J. White ... 30%

Clippers, Horse and Sheep—

Chicago Flexible Shaft Company:
'98 Chicago Horse, each ... $8.75
1902 Chicago Horse, each .. $10.75
20th Century Horse, each .. $5.00
Lightning Belt Horse, each .$15.00
Chicago Belt Horse, each .$20.00
Stewart's Enclosed Gear Horse, each ... $4.75
Stewart's Patent Sheep Shearing Machine, each ... $12.75
} 25%

Clips, Axle—

Regular Styles, list July 1, '05 .80%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Plain Bibbs, Globe, Kerosene, Racking, Liquor, Bottling, &c ... 70%
Compression Bibbs ..... 65&10%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list ... 40%
Leather, Walter B. Stevens & Son's list ... 40%

Combs, Curry—

Metal Stamping Co. ... 40%

Compasses, Dividers, &c.

Ordinary Goods ..... 75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers ... 65%
Calipers, Double, 65%; Inside or Outside ... 65%
Calipers, Wing ... 60%
Compasses ... 50%
Wm. Schollhorn Co.:
Excelsior Dividers ... 60%
Lodi Dividers ... 75%

Conductor Pipe,—

L. C. L. to Dealers:

Territory:	*Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	60&30%	6½&2½%	40&10%
Central:			
	70%	55&7½%	40&7½%
Western and Southern:			
	65&10%	55&2½%	40&5%
So. Western			
	62½&7½%	50&5%	40&2½%

Terms, 60 days, 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each	2	3	4	6	8
Labrador	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galvanized, ea.	$1.85	$2.00	$2.25	$2.90	$3.90
Galvanized, Lined, side handles, Gal.	2	3	4	6	8
Each	$1.95	$2.15	$2.40	$3.30	$4.15

White Enameled, 25%; Agate Lined .25%

Coopers' Tools—
See *Tools, Coopers'.*

Coppers' Soldering—

Soldering Coppers, 3 lbs. to pair and heavier, 23@24¢; lighter than 3 lbs. to pair ..... 25@26¢

Cord— Sash—

Braided, Drab ..... *lb.* 35¢
Braided, White, Com., Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Cable Laid Italian ..... *lb., A, 18¢; B, 16¢*
Common India ..... *lb.* 10@10½¢
Cotton Sash Cord, Twted. 17@19¢
Patent Russia ..... *lb...*@14¢
Cable Laid Russia .... *lb...*@15¢
India Hemp, Braided .. *lb...*@18¢
India Hemp, Twisted .. *lb.* 12@13¢
Patent India, Twisted .. *lb.* 12@13¢
Anniston Cordage Co.: ℔ lb, solid Braided, Nos. 8 to 12, $0.24; No. 7, $0.24½; No. 6, $0.25½; ℔ doz., 50 ft., Oriole, $2.00; 50 ft., Columbia, $0.85; 50 ft., Victors, $1.00; 50 ft., 6-Thread, $1.10; 60 ft., 3-Thread, $0.95; 50 ft., Manila, $1.40; 60 ft., Jute, $0.75.
Pearl Braided, cotton, No. 6, ℔ lb, 25½¢; No. 7, 25¢; Nos. 8 to 12, 24½¢
Eddystone Braided, Nos. 8, 9 and 10, 25¢; 7, 25½¢; 6, 26½¢.
Harmony Cable Laid Italian, Nos. 7 to 10 ... ℔ lb 23 ¢
Pullman:
Wire Sash Cord ... 10%
Sash Cord Attachments, per doz. .10¢
Samson, Nos. 8 to 12:
Braided, per lb., Drab Cotton, 40¢; Italian Hemp, 40¢; Linen, 55¢; White Cotton or Spot ... 35 ¢
Massachusetts, White ... ℔ lb 30 ¢
Massachusetts, Drab ... ℔ lb 35 ¢
Phoenix, White, Nos. 8 to 12, 27¢; No. 7, 27½¢; No. 6, 28½¢.
Silver Lake, per lb.:
A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen .. 57½¢
See also Chain and Ribbon.

Wire, Picture—

List July 10, 1906 ... 85&10&10@—
Hendryx Standard Wire Picture Cord, old list, 85&10%

Cradles—

Grain ..... 40&12½%

Crayons—

White Round Crayons, Cases, 100 gro., $6.50@$7.50 at factory, but lower prices made by jobbers

D. M. Steward Mfg. Co.:

Genuine.	Per gro.
Round Pencil, $2.25; Square Pencil, $1.75; Flat Crayon, $2.50, Metal Workers' Crayon, $3.00; Rolling Mill Crayon, $3.00.	

} Case lots, 30%.

Compo.	Per gro.
Round Pencil, $1.50; Square Pencil, $1.50; Flat Crayon, $1.50; Metal Workers' Crayon, $2.50; Rolling Mill Crayon, $2.50; Railroad Crayon, $4.00. Compo. Crayon, $4.00.	

} Case lots, 50&20%.

Zelnicker's Lumber:
Red, Blue, Green ... ℔ gro. $6.50
Black ... ℔ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, per doz., Heavy, $7.00; Light ... $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden ... 50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847 ℔ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor ... ℔ doz. $3.00
Wm. Rogers & Son ... ℔ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co. ... 40%
Red Devil ... 50%
Smith & Hemenway Co ... 50%
Woodward ... 40%

Meat and Food—

American ... 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise:

Nos.	5	10	12	22	32	
Each	$2	$3	$2.75	$4.50	$6	25@25&7½%

No. 222, $1.50 ... 40&7½%
Dandy ... ℔ doz. 40@50%

Nos.	1	2	3	4
	$11.00	$17.00	$19.00	$30.00

Ideal ... 40&10@50%
Little Giant ... ℔ doz. 40@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers ... 25%
New Triumph No. 605, ℔ doz. $24.00 ... 40@50%
Russwin Food, No. 1, $24.00; No. 2, $27.00 ... 45&10&10%
Woodruff's ... ℔ doz. 40@50%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers ... 25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c. ... 40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9 ... 35%
Kraut Cutters, 36 x 12, 40 x 12 ... 40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife ... ℔ doz. $3.00
Combined Slaw Cutter and Corn Grater ... ℔ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters ... 40%
Slaw Cutters, 1 Knife .. ℔ gr. $18@$20
Slaw Cutters, 2 Knife .. ℔ gr. $22@$30

Tobacco—

All Iron, Cheap .. doz. $4.25@$4.50
Enterprise ... 25@30%
National, ℔ doz., No. 1, $21; No. 2, $18 ... 40%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger .. per doz., $9.00
Iwan's Imp'ved Post Hole Auger .40&5%
Vaughan Pattern Post Hole Augers, ℔ doz., $6.25
Perfection Post Hole Diggers, ℔ doz. ... $8.25
Split Handle Post Hole Diggers, ℔ doz. $7.25
Kohler's, ℔ doz., Universal, $14.00; Little Giant, $12.00; Hercules, $10.00; Invincible, $9.00; Rival, $8.00; Pioneer ... $7.00
Never-Break Post Hole Diggers, ℔ doz., $24.00 ... 60%
Samson, ℔ doz. $34.00 ... 25%

Dividers—See *Compasses.*

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ℔ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers 35%
Diamond Wheel Dresser Cutters 35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each ... $1.50@$1.75
Breast, Millers Falls ... 15&10%
Breast, P., S. & W. ... 40%
Goodell Automatic Drills .40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3 ... 16⅔%
Johnson's Drill Points ... 16⅔%
Millers Falls Automatic Drills .33⅓&10%
Ratchet, Curtis & Curtis ... 25%
Ratchet, Parker's, 40%; Weston's .40%
Ratchet, Weston's, Style H Improved ... 40%
Ratchet, No. 012 ... 40%
Ratchet, Whitney's, P., S. & W. .50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00 ... 33⅓%

Twist Drills—

Bit Stock ..... 60&10&10@70%
Taper and Straight Shank .... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz .45@50¢
Balsey's Screw Holder and Driver, ℔ doz., 2½-in., $6; 4-in., $7.50; 6-in., ℔ ... 50%
Buck Bros.' Screw Driver Bits ... 30%
Champion ... 50%
Edson ... 40%
Fray's Hol. H'dle Sets, No. 3, $12 .50%
Ford's Brace Screw Drivers ... 40&10%
Gay's Double Action Ratchet ... 35%
Goodell's Auto .. 50&10&10@50&10&10&5%
Hurwood ... 40%
Mayhew's Black Handle ... 40%
Mayhew's Monarch ... 40&10%
Millers Falls, Nos. 20 and 21 .. 25&10%
Millers Falls, Nos. 11, 12, 41, 42 .15&10%
New England Specialty Co ... 50&10%
Smith & Hemenway Co ... 40&5%
H. D. Smith & Co.'s Perfect H'dle .40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles, 65%; No. 66, 75%; Victor, 55%; Defiance .. 70%
Swan's:
Nos. 7565 to 7568, 50%; No. 7540, 40&10%

Eave Trough, Galvanized—

Territory.	*L. C. L. Galvanized*		
	Galv. Steel.	*Charcoal Iron.*	*Copper. 14, 16&20 oz.*
Eastern:			
	80%	70&5%	40&10%
Central:			
	75&10&7½%	70%	40&7½%
Western and Southern:			
	70&20&7½%	60&15&2½%	40&5%
So. Western:			
	70&20%	65&2½%	40&2½%

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments, all territories: Galv. Steel and Galv. C. I. Standard Gauge ..... 60&10%
No. 26 ..... 50%

No. 2½.....85%
No. 22.....10%
Copper.....50%

Elbows, Stove Pipe—

Dover, one piece.....40%
Perfect Elbows (R. M. Co.).....40%

Emery, Turkish—

	4 to 46:	5 to 220:	Flour.
Kegs ..... *lb.*	5 ¢	5½ ¢	3½ ¢
½ Kegs..... *lb.*	5¼ ¢	5¾ ¢	3¾ ¢
¼ Kegs..... *lb.*	5½ ¢	6 ¢	4 ¢
10-lb. cans, 10 in case....	6½ ¢	7 ¢	6 ¢
10-lb. cans, less than 10.....	10 ¢	10 ¢	8 ¢
Less quantity..	10 ¢	10 ¢	8 ¢

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice

—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's .....50&10%
Walling's .....40&10%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined.. 60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star 60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined.. 50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&10%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 .....$3.75
Fusible Links, No. 96.....50%
Expansion Bolts, No. 107.....60&10%

Grindstone—

Net Prices:

Inch	15	17	19	21
Per doz.....	$3.25	3.75	4.25	4.75

P. S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Stowell's Giant Grindstone Hanger.. ℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy, 50&10&10%; Light.....60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....66⅔%
Champion, Hay.....66⅔%
Champion, Header.....66⅔%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp $2.75
Cotton 3.20
Waterproof Sgl. Taped.. 3.65
Waterproof Dbl. Taped.. 4.40
Waterproof Tpl. Taped.. 5.15

10&5%

Gates, Molasses and Oil—

Stebbins' Pattern.....80&10%

Gauges—

Marking, Mortise, &c..50@50&10%
Chapin-Stephens Co.:
Marking, Mortise, &c.....50&50&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....33⅓%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush.. 25&10@50%
International Glue Co. (Martin's)..40%

Grease, Axle—

Common Grade....*gro. $4.50@6.00*
Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, ℔ doz., 1 lb, $1.20; 2 lb.....$2.00
Helmet Hard Oil.....25%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00
Pike Mower and Tool Grinder, each $6.00
} 33⅓%

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Halters and Ties—

Cow Ties.....60&10@60&10&5%
Covert Mfg. Co.:
Web 45%
Jute Rope.....45%
Sisal Rope.....33⅓%
Cotton Rope.....45%
Hemp Rope.....45%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Niagara Coil and Halters..45@50&5%
Niagara Cow Ties....45&5@50&10&5%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox, Steel.....50%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&7⅛@33⅓&10&7⅛%
Engineers' and B. S. Hand.....50&7⅛&5@50&10&7⅛&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢...80&10%
3 to 5 lb., per lb., 40¢.....80&10%
Over 5 lb., per lb., 30¢..80&10&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c....60&10@60&10&5%
Hoe, Rake, &c.....45@50%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50%
D Handles.....50@50&5%

Cross-Cut Saw Handles—

Atkins' 40%
Champion .....45@45&10%
Disston's 50%

Mechanics' Tool Handles—

Auger, assortcd...*gro. $2.50@3.00*
Brad Awl.....*gro. $1.65@1.75*
Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, $2.40@ $2.65; Hickory.....*$2.15@2.40*
Socket Firming, Apple, $1.75@ $1.95; Hickory.....*$1.45@1.60*
Socket Framing, Hickory, $1.60@$1.75
File, assorted.....gro. *$1.30@1.40*
Hammer, Hatchet, &c. 60&10@60&10&5%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...*65@75¢*
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel .....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles .....15&10%
Nicholson Simplicity File Handle.... ℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door.....50%
Chicago Spring Butt Co.:
Friction 25%
Oscillating 25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator 30%
Railroad 50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10%
Roller Bearing.....70%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing, $4.00; Standard, $3.15; No. 105, $2.85; New Model, $2.80; New Champion $2.25
Barn Door, Standard.....60&5%
Hinged.....net $6.40
Covered .....60&2%
Special .....70&5%
Lawrence Bros.:
Advance and Sterling....60&10%
Cleveland and Peerless.....75%
Clipper, No. 75.....60%
Crown .....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.....50%
Giant .....60&5%
Hummer .....70&5%
New York.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60&5%
Richards Mfg. Co.:
Hangers, Nos. 47, 48, 147, 247, 60&5%
Pioneer Wood Track No. 3..$2.00
Ball B'r'g St'l Track No. 10.50&10%
Roller B'r'g St'l Track No. 12.$2.15
Roller B'r'g St'l Track No. 13.$2.30
Roller B'r'g, Nos. 39, 41, 43, 70&10%
Hero, Adj. Track No. 19..50&10%
Adjustable Track Tandem Trolley Track..No. 16.....50&10%
Seal, Steel Track No. 8.....$2.25
Auto Adj. Track No. 22..50&10%
Trolley B. D. No. 17, $1.25; F. D. No. 120, $2.10; No. 121, $2.25; No. 150.....$2.35
Safety Underwriters F. D. No. 101 .....50%
Tandem No. 41..2½ and 3 60&10%
Palace, Adjustable Track No. 132 .....50&10%
Royal, Adjustable Track No. 122.....50&10%
Ives' Wood Track No. 1.....$2.00
Trolley B. D. No. 20....50&10%
Trolley B. D. No. 24, $1.30; No. 27, $1.40; No. 28.....$1.60
Roller Bearings, Nos. 37, 38, 39, 41, 43; 44, Sizes 1 and 2..70&10%
Anti-friction, No. 42; No. 44, sizes 2½ and 3.....60&10%
Hinged Tandem No. 48....60&5%
Folding Door B. B. Swivel No. 135 .....40%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas, 60%; Freight Car Door.60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator 40%
Express 50%
Interstate .....60&10%
Lundy Parlor Door.....58&10%
Magic, 60%; Rex Hinge Door.60%
Matchless .....60&10%
Nansen .....70&5%
Parlor Door, 50&10%; Railroad, 50&10%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back, 70%; Eagle.....70%
Climax Anti-Friction.....50&10%
Hylo Hinge, New Perfection Pilot, Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%

Extra 5&10% often given.

Hangers— Garment—

Pullman Trouser, ℔ gro., 1 pair Flat Aluminoy, $9.00; 1 pair Round Nickeled, $9.00; 1 pair Round Nickeled, $27.00; 1 pair Flat Gun Metal, $12.00; 1 pair Flat Black Enameled, $7.50; 1 pair Wood Clamp, $13.00; Skirt Hangers, Folding, per gro., $21.00; Coat Hangers, Folding, per gro., $8.00; Garment Hanger Rods, Round Nickeled, per gro., $15.00; Garment Hanger Loops, Round Nickeled, per gro.....$15.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net $4.50

Joist and Timber—

Lane Bros. Co.....30%

Hasps—

Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—

Regular list, first quality....50%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 5, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair.....	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair.....	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair.....	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Charles Parker Co.....70@75%
Parker Wire Goods Co.:
Hale & Benjamin Automatic Blind Hinges 20%
Hale's Blind Awning Hinges, No. 110, for wood, $9.00; No. 111, for brick, $9.00.....20%
Reading's Gravity.....60%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55 .....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5.... 75&10&5%
Tip Pat'n, Nos. 1, 3 & 5 ....&10&5
Buffalo Gravity Lockir , Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L'Vchs.	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	.35

New England:
With Latch.....*doz.* ....@$2.00
Without Latch...*doz.* ....@$1.60
Reversible Self-Closing:
With Latch.....*doz.* ....@$1.75
Without Latch...*doz.* ....@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets.

Nos.	1	2	3
Hinges with Latches..	$2.00	2.70	5.00
Hinges only.....	1.40	2.05	3.80
Latches only.....	.70	.70	1.35

Pivot Hinges

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback, Cast Iron...*$6.50@$7.00*
Non-Holdback, Cast Iron$6.25@$6.75
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent 'Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor..40%
Bommer Spring Hinges.....40%
No. 999 Wrot. Steel Hold Back, ℔ gr. $9.00
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor..50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American 30%
Columbia, ℔ gr., No. 14, $9.00; No. 18, $25.00
Columbia, Adj., No. 7, ℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.00
Oxford, new list.....30%
Floor Spring Hinges.....65&10%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges 40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....℔ gr. $9.00
Ball Bearing Floor Hinge...80%
Ohio Detachable Screen Door Hinge .....℔ gr. $12.00
Superior Spring Hinge Co.:
Superior Floor Hinges.....33⅓%
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k, ℔ gro. pr. $9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:
Light Strap Hinges...65%
Heavy Strap Hinges..75%
Light T Hinges.....60%
Heavy T Hinges.....55%
Extra H'y T Hinges..70%
Hinge Hasps.....45%
Cor. Heavy Strap....75%
Cor. Ex. Heavy T..70&10%

Extra, list 5&10&10%

Screw Hook and Strap. { *6 to 12 in.* ..lb. 3¾¢ / *14 to 20 in.* ..lb. 3½¢ / *22 to 36 in.* ..lb. 3¼¢

Screw Hook and Eye:
¾ to 1 inch.....lb. 6½¢
⅝-inch.....lb. 7½¢
½-inch.....lb. 8½¢

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers..30&2%

Hods— Coal—
Per doz.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each $0.95
Steel Mortar, No. 156.....each $1.25

Hoes— Eye—
Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....33⅓%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding No. 1, $2.00; No. 2, $2.28
Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ₩ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....₩ doz. 66⅔%
Junior Size.....₩ doz. $4.00
Ft. Madison Sprouting Hoe..₩ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.38
Acme Wedding.....₩ doz. net, $4.35
W. & C. L'tning Shuffle Hoe, ₩doz.$4.85

Hoisting Apparatus—
See *Machines, Hoisting.*

Holders— Bit—
Angular, ₩ doz. $24.00.....45&10%

Door—
Bardsley's.....45%
Empire.....50%
Pullman.....50%
Superior.....33⅓%

File and Tool—
Nicholson File Holders and File Handles.....33⅓&10%

Fruit Jar—
Triumph Fruit Jar Holder, ₩ gross, $10.80; ₩ doz.....$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....*80&10@...%*
Wire C. & H. Hooks:.....
75&10@75&10&10%
Columbian Hdw Co., Gem.....70&10%
Parker Wire Goods Co., King..70&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%; Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.60
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&5@60&10&5%*
Malleable Iron.....*70@70&10%*
Covert Mfg. Co. Gate and Scuttle Hooks.....40%
Ft. Madison Cut-Easy Corn Hooks, ₩ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See *Nails, Horse.*

Horseshoes—
See *Shoes, Horses.*

Hose, Rubber—
Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Guaranteed..*ft. 8 @ 9 ¢*
4-ply Guaranteed..*ft. 10 @11 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—
From 4 to 10.....*lb. 3 @3½¢*
B. B. Sad Irons.....*lb. 3¼@3½¢*
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*65*	*62*	*75*	*72*
Tin'd Tops	*70*	*67*	*80*	*77*

New England Pressing..*lb. 3¾@4¢*

Pinking—
Pinking Irons.....*doz. 60¢*

Irons, Soldering
See *Coppers.*

Jacks, Wagon—
Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130...50&10%
Smith & Hemenway Co.'s.....25%

Kettles—
Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros.' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—
Wilkinson Wilcut Brand Knives and Hooks.....60%
Withington Acme, ₩ doz. $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—
Standard List.....*75&5@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Swan's.....75%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—
Serrated Edge, per doz. $5.75@6.00
Iwan's Sickle Edge.....₩ doz. $9.50
Iwan's Serrated.....₩ doz. $10.00

Mining—
Buffalo.....₩ gro. $13.00

Miscellaneous—
Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....₩ doz. $3.00@3.25

Knobs—
Base, 2½-inch, Birch, or Maple, Rubber Tip.....*gro. $1.25@$1.50*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..*doz. $2.05@2.15*
Bardsley's Wood Door, Shutters, &c.15%

Lacing, Leather—
See *Belting, Leather—*

Ladders, Store, &c.—
Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 100.....50%

Ladles, Melting—
L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....50%

Lanterns—Tubular—
Regular Tubular, No. 0.....
doz. $4.25@4.50
Lift Tubular, No. 0.....
doz. $4.75@5.00
Hinge Tubular, No. 0.....
doz. $4.75@5.00
Other Styles.....*40@40&5%*

Bull's Eye Police—
No. 1, 2¾-inch.....*$2.75@3.00*
No. 2, 3-inch.....*$3.00@3.25*

Lasts and Stands, Shoe—
Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—
Roggin's Latches, with screw..
doz. 35@40¢

Door—
Allith Mfg. Co., Automatic, No. 400, ₩ doz.....$4.00
Cronk & Carrier Mfg. Co., No. 101, ₩ doz. $2.00
Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....$1.50
Stowell's Steel.....50%

Leaders, Cattle—
Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.:
Cotton, Hemp and Jute, 45%; Sisal, 33⅓%.

Lifters, Transom—
R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.25*	*2.00*	*1.75*
75 feet	*$1.75*	*1.55*	*1.10*

Anniston Waterproof Clothes, 50 ft., ₩ gro., $25.00; Gilt Edge, $23.00; Air Line, $23.00; Acme, $18.00; Alabama, $17.00; Empire, $16.00; Advance, $14.00; Eclipse, $13.50; Chicago, $11.50; Standard, $10.50; Columbia, $9.50; Allston, $13.50; Calhoun, $12.00.
Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 8...40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....₩ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....25%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....25%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%

Locks— Cabinet—
Cabinet Locks...*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—
NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%

Elevator—
Stowell's.....50%

Padlocks—
Wrought Iron....*75&10&5@80&5%*
Net prices are general.
R. & E. Mfg. Co. Wrought Steel and Brass.....75&10%

Sash, &c.—
Ives' Patent:
Bronze and Brass, 62½%; Crescent, 50&10%; Iron, 62½%; Window Ventilating, 60%; Robinson Pat. Ventilating Sash Lock, 40%; Wrought Bronze and Brass, 55%; Wrought Steel, 55%.
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—
Com. Up'rt, without Augers,
$2.00@2.25
Com. Angl'r, without Augers,
$2.25@2.50
Swan's Improved.....40&10%
Angular
Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—
Reisinger Invincible Hand Power.....
₩ doz. $48.00

Fence—
Williams' Fence Machines....each, $5.50

Hoisting—
Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—
Chandler's.....12½%

Washing—
Boss Washing Machine Co.: Per doz.
Boss No. 1.....$57.00
Boss Rotary.....$54.00
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cintl Square Western:.....$30.00
Unceda American, Round.....$30.00

Mallets—
Hickory.....*45&5@50%*
Lignumvitæ.....*45&5@50%*
Tinners' Hickory and Applewood.....*doz. 45&5@50%*

Mangers, Stable—
Swett Iron Works.....50%

Mashers, Vegetable—
Western, W. G. Co., Potato....60&10%

Mats, Door—
Elastic Steel (W. G. Co.), new list..
50&10%
Keystone Wire Matting Co.:
Keystone.....50%
Ideal.....50%

Mattocks—
See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—
Enterprise Mfg. Co.....20@25%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria..50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—
NOTE.—Net prices are generally quoted
Cheapest.....*all sizes, $1.85@2.00*
Cheap.....*all sizes, $2.00@2.50*
Better Grade..*all sizes, $2.50@4.50*

	12	*14*	*16*	*18-in.*
High Grade	*$4.50*	*4.75*	*5.00*	*5.25*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list..70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr. Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Granite State:
Style A, Low Wheel....70&10&10&5%
Style B, Low Wheel.....70&10&5%
Style C, High Wheel.....70&10%
Style D, High Wheel.....70%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list..50%

Nails—
Wire Nails and Brads, Miscellaneous.....*65&10@85&10&5%*
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	...40&5%

Western.....₩ lb 8½¢
Jobbers' Special Brands.....
per lb. 9@10¢

Picture—

	1½	*2*	*2½*	*3*	*in.*
Brass H'd.	*45*	*55*	*60*	*70*	*.. gro*
Por. Head.	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—
See *Pliers and Nippers.*

Nuts—
Cold Punched: Off list.
Square, Blank or Tapped..
4.90@5.00¢
Hexagon, Blank or Tapped..
5.30@5.40¢
Square, Blank, C. & T.5.20@5.30¢
Hexagon, Blank, C. & T...
5.90@6.00¢
Hot Pressed:
Square, Blank.....*5.10@5.20¢*
Hexagon, Blank.....*5.50@5.60¢*
Square, Tapped.....*5.00@5.10¢*
Hexagon, Tapped.....*5.40@5.50¢*

Oakum—
Best.....*lb., 6½¢*
U. S. Navy.....*lb., 6¢*
Navy.....*lb., 5¢*
Plumbers' Spun Oakum.....*3½¢*
In carload lots ⅛¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10&5@70%*
Zinc.....*65&10&5@70%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Imp'ed, Nos. 11, 12 and 13, 20%; Old Pattern, Nos. 1, 2, 3, 50%.
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can— *Per doz.*
Sprague, Iron Handle.....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50&10%
Stowell's Sprague.....₩ doz. 35@45¢
Vim Tin Shear and Can Opener, ₩ doz., 75c.; per gro., $7.50

Egg—
Nickel Plate, ₩ doz., $2.00; Silver Plate, $4.00.

Packing—
Asbestos Packing, Wick and Rope.....*17@22¢*

Rubber—
(*Fair quality goods.*)
Sheet, C. I......*11@12¢*
Sheet, C. O. S......*11@12¢*
Sheet, C. B. S......*12@13¢*
Sheet, Pure Gum.....*40@45¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ₩ lb 80¢.....25@25&5%

Miscellaneous—
American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—
R. M. Co., with gauges—No. 1, $6.25; No. 2, $6.50 ₩ doz.

Pails, Water, Well, &c.—
See *Buckets.*

Pans— Dripping—
Standard List.....*65&10%*

Fry—
Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz.	*$1.75*	*2.25*	*2.80*	*3.15*

Roasting and Baking—
Regal, R. M. Co., ₩ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ₩ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ₩ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Roll Board or Building Felt, 6 to 30 lb., per 100 sq. ft.	*6¢*
Roll Board or Building Felt, 3-32 and ⅛ in., 45 to 60 lbs., per 100 sq. ft.	*8¢*
Mill Board, Sheet, 40 x 80 in., 1-32 to ⅛ in.	*7¢*

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll
35@40¢
Medium weight, 30 lbs. to roll,
40@45¢
Heavy weight, 40 lbs. to roll..
48@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$18.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—
1 ply (roll 500 sq. ft.). ton.....
$32.50@35.50
2 ply, roll 108 sq. ft.....*55¢*
3 ply, roll 108 sq. ft.....*75¢*
Slater's Felt (roll 500 sq. ft.)..*70¢*

Sand and Emery—
Flint Paper and Cloth..*50&10@60%*
Garnet Paper and Cloth.....*oc%*
Emery Paper and Cl'h..*50&10@60%*

Parers— Apple—
Advance.....₩ doz. $4.00
Baldwin.....₩ doz. $4.00
Bonanza Improved.....each $8.50
Daisy.....₩ doz. $4.00
Dandy.....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....₩ doz. $15.00
Improved Bay State.....₩ doz. $36.00
Little Star.....₩ doz. $8.00
New Lightning.....₩ doz. $7.00
Reading 72.....₩ doz. $3.25

Reading 78.....₱ doz. $6.25
Rocking Table.....₱ doz. $6.20
Turn Table '98.....₱ doz. $6.00
White Mountain.....₱ doz. $5.00

Potato—

Saratoga .....₱ doz. $7.00
White Mountain.....₱ doz. $6.00

Picks and Mattocks—

List, Feb. 23, 1899.....75@75&5%
Cronk's Handled Garden M——z ₱ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....50&10@60%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.50&10@50&10&5%
Extra Heavy, 2-6 in.....65&10%
Fittings .....70&10@70&10&5%

Pipe, Merchant—

Consumers, Carloads.

	Steel. Blk.	Galv.	Iron. Blk.	Galv.
⅛ & ¼ in.	71%	55%	68%	52 %
⅜ in.	73%	59%	70%	56 %
½ in.	75%	63%	72%	60 %
¾ to 6 in.	79%	69%	76½%	66½%
7 to 12 in.	74%	59%	71½%	56 %

Pipe, Vitrified Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....68%
New York and New Jersey.71%
Maryland, Delaware, E. Pa.73%
West. Pa. and West Va.....75%
Virginia 76%
Ohio, Michigan and Ky.....75%
Indiana 77%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	9.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....35@35&10%
Bench, second qual...45@45&10%
Molding .....30@30&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....35@35&10%
Bench, Second Quality....45@45&10%
Molding .....30@30&10%
Toy and German.....35@35&10%
Chapin's 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chapin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Union 60%

Plane Irons—

Wood Bench Plane Irons.....25@25&10%
Buck Bros.....30%
Chapin-Stephens Co.....25@25&10%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....₱ doz. $8.50

Plates—

Felloe .....lb.4@4¼¢
Self-Sealing Pie Plates (R. M. Co.), ₱ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers....75&10@75, 10, 5%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 $2.00, 8 $2.25, 10 $2.75, 12-in. $3.50
Acme Nippers.....50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
The Nettleton Mfg. Co. Reversible Cutting Nippers.....40%
P., S. & W. Tinners' Cutting Nippers 40%
Wm. Schollhorn Co.:
Bernard, 33⅓%; Elm City, 33⅓%; Lodi, 50%; Paragon, 50%.
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&5%
Chapin's Imp. Brass Cor..40@40&10%
Pocket Levels.....30@30&10&5%
Extension Sights.....30@30&10&5%
Machinists' Levels.....40@40&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....65%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers,.....lb. 10¢
½-lb. papers.....lb. 9@10½¢
¼-lb. papers.....lb. 9¾@11¢

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison Western.....₱ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal, Etc—

Glashrite, No. 2, 5 lb can (powder), each, $1.25; ₱ doz., $12.00; No. 2, 10 lb can (cake), each, $2.50; ₱ doz., $24.00.
Prestoline Liquid, No. 1 (½ pt.), ₱ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gro. $4.50; ½ lb boxes, ₱ doz. $1.25; 1 lb boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz., $1.25; ₱ gro. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz., $1.75; ₱ gro., $18.00.
Wynn's White Silk, ⅓ pt. cans, ₱ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ₱ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ₱ doz. 75¢
Black Jack Paste, ¾ lb cans, ₱ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty Liquid, per 100 tins.....$6.75
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ lb 9¢
Fireside .....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese .....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ₱ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....₱ doz. $1.00
Black Silk, 5 oz. box.....₱ doz. $0.75
Black Silk, ⅓ pt. liq.....₱ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $8.00
1 qt., Round.....gro. $9.00
1½ qt., Square.....gro. $10.00
2 qt., Square.....gro. $12.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½ lb.....each 15¢
Rifle, 1-lb.....each 25¢
In Kegs:
12½-lb. kegs.....$3.50
25-lb. kegs.....$4.50
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	9.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ₱ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ₱ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ₱ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, case lots, ₱ doz., No. 2, $6.00; No. 3, $5.50.
Giant No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....33⅓%
Staple Pullers.....60%
Parrot Tack and Stub Puller, ₱ doz., 75c.: ₱ gro., $6.00

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye, doz., 4 in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz.	$0.65	.85	1.20	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	$0.16	.19	.23	.30
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	$0.23	.40	.53	.67
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in....17@18¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in... ₱ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&10%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....₱ doz. $6.75
Flint & Walling's Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list) .....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$6.00
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50&10%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	2.50	2.75	3.00
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	3.60	3.85	4.10	4.40

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes) ..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's Nos. 1AA, 1A, 1B, 1C, $15.00 .....50%
Hercules, 1 die, each $5.00.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Wm. Schollhorn Co.:
Bernard 33⅓%
Lodi, 50%; Paragon.....50%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co...40%
Tinners' Solid, P., S. & W. Co., ₱ doz., $1.44.....60%

Rail—Barn Door, &c.—

Sliding Door, Painted Iron.... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.: Reliable Hanger Track 50%
Cronk's:
Double Braced Steel Rail..₱ ft. 2¾¢
O. N. T. Rail.....2½¢
Griffin's:
xxx, ₱ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ₱ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ₱ 100 ft., 1 in., $3.40; 1¼ in., $4.10.
O. N. T. ₱ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....₱ 100 ft. $4.00
Lawrence Bros.:
₱ 100 ft. No. 201, $4.00; No. 202, $4.00
New York, 1 x 3-16 in., ₱ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ₱ ft., 11¢..50%
None Better.....₱ ft. 3¾¢
Standard .....₱ ft. 4 ¢
Myers' Stayon Track.....60&10%
Richards' Mfg. Co.:
Common, 1 x 3-6 in., $3.00; 1⅛ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail...60&10%
Lag Screw Rail, No. 65.....50%
Gauge Trolley Track, ₱ ft., No. 31, 9¢; No. 32, 14¢; No. 33, 20¢.
No. 50.....60&10%
Nos. 61, $3.00; 62, $3.25; 63, $3.50; 64, $4.00; 45, $3.25; 46, $3.50; 49, No. 1, $3.25; 49, No. 2, $3.50.
Stowell's:
Cast Rail.....₱ ft. 1¾ ¢
Steel Rail, Plain.....2¾¢
Wrought Bracket, 1 3-16 in...₱ ft. 2¢
Wrought Bracket, 1¼ x 5-16..₱ ft. 7¢
Swett's Hylo, ₱ ft. 11¢.....60%
P. L. B. Steel Rail.....₱ 100 ft. $3.00
No. 0, 1 x 3-16.....₱ 100 ft. $2.75

Rakes—

NOTE.—Many goods are sold at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ₱ doz., net.....$4.25
Cronk's:
New Champion Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ₱ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.....80%
Queen City Lawn, ₱ doz., 20 teeth, $3.45; 24, $3.60.....net.
Anticlog Lawn, ₱ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....₱ doz. $3.45
Lawn Queen, 24-tooth.....₱ doz. $3.60
Paragon, 20-tooth.....₱ doz. $2.75
Paragon, 24-tooth.....₱ doz. $3.00
Steel Garden, 14-tooth....₱ doz. $2.40
Malleable Garden, 14-tooth, ₱ doz. $1.75@2.00

Rasps, Horse—

Disston's 75%
Heller Bros.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Boras—I C.....60%
Fox Razors, ₱ doz., No. 42, $20.00; No. 44, $20.00; No. 82, Platina, $25.00. } Dis. 40%
Red Devil.....50%
Silberstein:
Carbo Magnetic, $18.00; Griffon, No. 65, $15.00; Griffon, No. 00, $12.00; all other Razors, 40%.

Safety Razors—

Kampfe Bros.:
Star Safety, 25%; Star Interchangeable, 25%; Star Safety Corn, 25%.
Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¾, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German silv., Bronze.25%
1240 N, 124 N.....20%
3001 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P., 33½%; 2904 PN., 33⅓%; 0924 N., 33⅓%; 02084 N., 33⅓%; 002904 PN., 33⅓%; 802 N., 33⅓%.
986 PN., 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Japanned, Electroplated and Bronzed 70%
White Porcelain Enamel....60%
Solid Brass or Bronze Metal, 40&10%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal..$1.85
Double Action, 44 caliber....$2.00
Automatic $3.25
Hammerless $3.75

Riddles, Hardware Grade

16 in.....per doz.$2.50@$2.75
17 in.....per doz.$2.75@$3.00
18 in.....per doz.$3.00@$3.25

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 inch.*
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper, 2 in., ₱ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....45@45&5%
Iron or Steel.....75@75&5%

Bifurcated and Tubular—

Assorted in Boxes.
Bifurcated, per doz. boxes, pasteboard boxes, 23@25¢; Tin boxes, 29@32¢.
Tubular, per doz. boxes, 50 count, 29@32¢; 100 count, 51@58¢.

Rollers—

Acme, Stowell's Anti-Friction.....50%
Cronk's Stay No. 65, $0.90; No. 50 .....$1.00
Cronk's Brinkerhoff No. 55, $0.60; No. 56.....$0.84
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.75¢
O. K. Adj. and Reversible No. 56.50¢
Lag Screw, Nos. 55 and 57.....50%
Underwriters', Nos. 59, 60.....50%
Favorite, No. 54.....60%
Stowell's Barn Door Stay..₱ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....₱ doz. 65¢
Hinge Adjustable Stay.....₱ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger: Pure .....lb., 12½¢
Sisal, 7-16 in. diam. and larger: Pure .....lb., 9¢
Sisal, 7-16 in. diam. and larger: No. 2 quality.....lb., 7¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse: Mixed .....lb., 7¾¢
Pure .....lb., 9¢
Sisal, Tarred, Medium Lath Yarn, Coarse and Untarred: Mixed .....lb., 7¾¢
Pure .....lb., 9¢
Cotton Rope: Best, ¼-in. and larger..16½@18¢
Medium, ¼-in. and larger, 15½@16½¢
Common, ¼-in. and larger..10¢
In coils, ½¢ advance.
Jute Rope: Thread, No. 1, ¼-in. & up, lb.7¼¢
Thread, No. 2, ¼-in. & up, lb..7¢
Old Colony Manila Transmission Rope .....₱ lb 17½¢

Wire Rope—

Galvanized .....37½&40&2½%
Plain .....45&21½%

Ropes, Hammock—

Covert Mfg. Co.:
Jute, 45%; Sisal.....33⅓%

Rules

Boxwood .....60@60&10%
Ivory .....35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood 60%
Flexifold .....27½&10&10%
Ivory .....35@35&10&10%
Miscellaneous .....50@50&10&10%
Stephens' Combination.....55@55&10%
Stationers' .....10@10&10%
Keuffel & Esser Co.:
Folding, Wood.....35&10%
Folding, Steel.....33⅓&10%
Lufkin's Steel.....50&10%
Lufkin's Lumber.....60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 40%
Zig Zag.....40%
Zig Zag, Pin Joint.....42½%
Upson Nut Co.:
Boxwood .....60@60&10%
Ivory .....35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Hand .....50&10@60%
Cross Cuts.....35&5%
Mulay, Mill and Drag.....50%
One-Man Saw, 40%; Wood Saws, 40%; Hand, Compass, &c., 40%.
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide.....60%
Band, ¼ to 1¾.....60%
Crosscuts 50%
Narrow Crosscuts.....55%
Mulay, Mill and Drag.....50%
Framed Woodsaws.....35%
Woodsaw Blades.....35%
Woodsaw Rods.....35%
Hand Saws, Nos. 12, 20, 9, 16, d100, D8, 120, 76, 77, 8.....22%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination.....30%
Compass, Key Hole, &c.....25%
Butcher Saws and Blades.....35%
C. E. Jennings & Co.'s:
Back Saws.....25%
Butcher Saws.....30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws.....30%
Hand Saws.....20&2½%
Wood Saw Blades.....35%
Millers Falls:
Butcher Saws.....15&10%
Star Saw Blades.....15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws.....50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts.....40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws.....50%
Back Saws.....25@25&7½%
Butcher Saws.....35@35&7½%
Hand Saws.....25@25&7½%
Hand Saws, Bay State Brand.....45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws.....35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saws—

Atkins' Hack Saw Blades A ▲ A...35%
Disston's:
Concave Blades.....25%
Keystone 40%
Hack Saw Frames.....30%
Fitchburg File Works, The Best...35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.....40&7½%
Hack Saws, Nos. 175, 180, complete, 60&7½%
Goodell's Hack Saw Blades.....40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades.....35%
Diamond Hack Saw Frames.....50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%
Sterling Power Hack Saw Machines, each, No. 1, $25.00; No. 2, $30.00..10%
Victor Hack Saw Blades.....25%
Victor Hack Saw Frames.....40%

Scroll—

Barnes, No. 7, $15.....35%
Barnes' Scroll Saw Blades.....40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20.....20%
Lester, complete, $10.00.....15&10%
Rogers, complete, $4.00.....15&10%

Scales—

Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. .....doz. $5.50
Two Platforms, ½ oz. to 8 lbs. .....doz. $18.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.83@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales.....40%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2.....60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables.....50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle.....doz. $2.00@2.25
Box, 2 Handle.....doz. $2.50@2.60
Ship....Light, $2.00; Heavy, $4.50
Adjustable Box Scraper (S. R. & L. Co.), $6.00.....
Chapin-Stephens Co., Box, ...45%
30@30&10&10%

Screens, Window and Frames—

Maine Screen Frames.....40&10&5%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@2.75; 1¼, $3.00@3.25; 1¼ $3.50@3.75
Bench Wood .....25@25&5%
Hand, Wood .....25@25&5%
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand.....25%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 .....75&15%
Coach, Gimlet Point, list Oct. 1, '99.....75&10%
Hand Rail, list Jan. 1, '81.... 70&10@75%

Jack Screws—

Standard List.....75&10@80%
Millers Falls.....50&10&10%
Millers Falls, Roller.....50&10%
P., S. & W.....50&10%
Swett Iron Works.....50%
.....75@80%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—

Set (Iron) .....80@80&5%
Set (Steel), net advance over Iron 25%
Sq. Hd. Cap.....75%
Hex. Hd. Cap.....75%
Rd. Hd. Cap.....60&10%
Fillister Hd. Cap.....60&10&10%

Wood—

List July 23, 1903.
Flat Head, Iron....87½&10@..%
Round Head, Iron....85 &10@..%
Flat Head, Brass.....82½&10%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws.....87½&10%

Scroll Saws—
See *Saws, Scroll.*

Scythes—

	Per doz.
Grass, No. 1, Plain....	$6.25@6.75
Clipper, Bronzed Webb..	$6.50@7.00
No. 3 Clipper, Pol'd Webb..	$6.75@7.25
No. 6 Clipper and Solid Steel,	$7.00@7.50
Bush, Weed and Bramble, No. 2.	$6.50@7.00
Grain, No. 1.....	$8.25@8.75
Bronzed Webb, No. 1..	$8.50@9.00
Nos. 3 and 4 Clipper, Grain..	$8.75@9.25
Solid Steel, No. 6.....	$9.25@9.75

Seeders, Raisin—

Enterprise .....25@30%

Sets—Awl and Tool—

Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7.....50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel.....⅌ doz sets $9.00

Sets, Nail—

Octagon .....gro. $3.50@3.75
Buck Bros.....27½%
Cannon's Diamond Point, ⅌ gro.$12.40%
Mayhew's .....⅌ gro. $9.00
Snell's Corrugated, Cup Pt....⅌ gro. $7.20
Snell's Knurled, Cup Pt....⅌ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt.⅌ gro. $7.50

Rivet—

Regular list.....75@75&10%

Saw—

Aiken's:
Genuine .....50&10%
Imitation .....50&10%
Atkin's:
Criterion .....50&10%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut.....40%
Plate 30%
Disston's Star and Monarch.....20%
Morrill's No. 1, $15.00.....25%
Nos. 3 and 4, Cross Cut, $20.00...50%
No. 5, Mill, $30.00.....50%
Nos. 10, 11, 95, $15.60.....50%
No. 1 Old Style, $10.00.....50%
Special, $16.25.....50%
Giant Royal Cross Cut.....⅌ doz. $8.00
Royal, Hand.....⅌ doz. $4.50
Taintor Positive.....⅌ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30 .....⅌ doz., net, $24.00
Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....70%
Pike Mfg. Co.:
Fast Cut Pocket Knife Hones, ⅌ doz.....$1.50
Mounted Kitchen Sand Stone, ⅌ doz.....$1.50
Natural Grit Carving Knife Hones, ⅌ doz.....$3.00
Quick Cut Emery Carving Knife Hones, ⅌ doz.....$1.50
Quick Edge Pocket Knife Hones, ⅌ doz.....$2.00
} 40%

Skate—

Smith & Hemenway Co.....20%

Shaves, Spoke—

Iron .....doz.$1.10@1.25
Wood .....doz .$1.75@2.25
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ⅌ doz. $9.00.....15&10%
Wood's F1 and F2.....50%

Shears—

Cast Iron..	7	8	9 in.
Best	$16.00	18.00	20.00 gro.
Good ...	$13.00	15.00	17.00 gro.
Cheap ..	$5.00	6.00	7.00 gro.

Straight Trimmers, &c.:
Best quality Jap....70@70&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap....80@80&5%
Fail quality, Nickel..75@7"&10%
Tailors' Shears.....40@40&10%
Acme Cast Shears.....40@40&5%
Heinisch's Tailor's Shears.....10%
Wilkinson's Sheep, 1900 list, 30&10&5%; Grass, 50&10%; Horse or Mule, 50&10%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, ...50@50&5%
Heinisch's Snips.....40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in.....50%
Niagara Snips.....40%
P., S. & W. Forged Handles.....20%

Pruning Shears—

Cronk's Hand Shears.....33⅓%
Cronk's Wood Handle Shears.....33⅓%
Disston's Combined Pruning Hook and Saw, ⅌ doz. $18.00.....25%
Disston's Pruning Hook, ⅌ doz. $12.00 .....25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades....50&10%
P., S. & W. Co.....33⅓%
Wilkinson's Hedge, Wilcut Brand, ...60&10%
Wilkinson's Lawn and Border, Wilcut Brand.....60&10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%
Reading 40%
R. & E. list.....40%
Wrightsville Hatfield Pattern.....33⅓%

Sliding Shutter—

Reading list.....40%
R. & E. list.....33⅓%

Shells—Shells, Empty—

Brass Shells, Empty:
Climax, Club, Rival, 10 and 12 gauge .....65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge 20%
Climax, Union, League, New Rival, 10 and 20 gauge.....20%
Climax, Union, League, New Rival, 14, 16 and 20 gauge.....25%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge.....33⅓
Robin Hood, Low Brass.....20&5%
Robin Hood, High Brass.....30&5%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade.....40&5%
Loaded with Smokeless Powder, high grade.....40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass.....50%
Comets, High Brass.....50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron .....per keg $4.00
Steel .....per keg $3.75
Burden's, all sizes.....⅌ keg $3.90

Shot—

Drop, up to B, 25-lb. bag....$1.85
Drop, B and larger ..... per 25-lb. bag, $2.10
Buck, 25-lb. bag.....$2.10
Chilled, 25-lb. bag.....$2.10
Dust, 25-lb. bag.....$2.30

Shovels and Spades—

Association List, Nov. 15, 1902..40%

Snow Shovels—

Long Handle.....$2.75@3.00
Wood and Mail, D. Handle, $3.25@3.50

Sieves and Sifters—

Hunter's Imitation..... gro.$9.50@10.00
Hunter's Genuine..... per gro. $12.00@12.50
Buffalo Metallic Blued, R. M. Co., ⅌ gr.

14&16	16&18	18&20
$13.20	$13.50	$14.40

Sieves, Seamless Metallic

	Per dozen.			
Mesh	*14*	*16*	*18*	*20*
Iron Wire	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....doz. $0.90@0.95
Mesh 20, Nested....doz. $1.00@1.05
Mesh 24, Nested....doz. $1.30@1.40

Sinks, Cast Iron—

Painted, Standard list:
12 x 12 to 22 x 36 in.. .60&5%
20 x 40 to 24 x 50 in.....55%
24 x 60 to 24 x 120 in.....33⅓%
Barnes' low list:
Up to and including 20 x 36 in....60%
20 x 40 to 24 x 50 in.....55%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....80@80&10%
Steel .....40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless..
Victor A, Noiseless..60&4 tens 65%
60&5 tens

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German .....40@40&10%
Covert Mfg. Co.:
Derby, 30&2%; Yankee, 30&2%; Yankee Roller, 30&2%; High Grade, 45%; Trojan.....45%
Jockey 35%
Oneida Community:
Harness Snaps, 1 inch.....60&5%
Swivel Snaps.....60%
Swivels 50%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—

Silver Plated—

Good Quality.....50&10@60&5%
Cheap .....60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton .....40&10%
Rogers & Bro., William Rogers' Eagle Brand.....50&10%
Anchor, Rogers Brand.....60%
Wm. Rogers & Son.....60&10%

Miscellaneous—

German Silver.....60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver.....50%

Tinned Iron—

Teas .....per gro. 45@50¢
Tables.....per gro. $0.50@$1.00

Springs—Door—

Chicago (Coil).....40&10%
Gem (Coil).....40&10%
Pullman (Coil).....20%
Reliance (Coil).....25%
Star (Coil).....40&10%
Torrey's Rod, 39 in.....⅌ doz. $1.15

Carriage, Wagon, &c.—

1¼ in. and Wider: *Per lb*
Black .....4@4¼¢
Half Bright.....4@4¼¢
Bright .....4½@4¾¢
Painted Seat Springs:
1½ x 2 x 26.....per pr. 42¢
1½ x 3 x 28.....per pr. 70¢

Sprinklers, Lawn—

Enterprise .....25@30%
Philadelphia No. 1, ⅌ doz. $12; No. 2, $15; No. 3, $24.....30%
Pleuger & Henger Mfg. Co.:
Cactus, 70%; Japanese, 75%; Nationals, 65%.

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron.. } *75&10@75&10&5%*
Rosewood Hdl. Try Square and T-Bevels .....60&10&10@70%
Iron Hdl. Try Squares and T-Bevels .....40&10@40&10&10%
Disston's Try Sq. and T-Bevels...70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2.....50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap .....doz. $1.00
Good Grade.....doz. $1.25
Tinned Iron.....doz. $1.25
Iron, Porcelain Lined...doz. $1.75

Staples—

Barbed Blind.....lb. 6@6½¢
Electricians', Association list .....80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... per lb. 3¼@3½¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros.....30%
C. & A. Hoffmann's.....40%

Steelyards—....30@30&10%

Stocks and Dies—

Blacksmiths' .....50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates.....25%
Green River.....25%
Lightning Screw Plate.....25%
Little Giant.....25%
Reece's New Screw Plates.....25%

Stoners, Cherry—

Enterprise .....25@30%

Stones—Oil, &c.

Chicago Wheel & Mfg. Co., 1904 list; Gem Corundum Oil, Double Grit,60%
Gem Corundum Axe, Single or Double Grit.....60%
Gem Corundum Slips.....60%
Gem Corundum Razor Hones....50%
Pike Mfg. Co., 1904 list:

	⅌ lb.
Arkansas St. No. 1, 3 to 5¼ in.	$2.80
Arkansas St. No. 1, 5½ to 8 in.	3.50
Lily White Washita, 4 to 8 in.	4.00
Rosy Red Washita, 4 to 8 in.	60¢
Washita St., Extra, 4 to 8 in.	50¢
Washita St., No. 1, 4 to 8 in.	40¢
Washita St., No. 2, 4 to 8 in.	30¢
Lily White Slips	90¢
Rosy Red Slips	80¢
Washita Slips, Extra	80¢
Washita Slips, No. 1	70¢
Washita Slips, No. 2	40¢

} 33⅓%

India Oil Stones (entire list).....33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%

Hindostan No. 1, B'g'lar. ℔ lb 8¢
Hindostan No. 1, Small.. ℔ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....℔ lb 80¢
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
} 33⅓%

Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots.....℔ gro. $9.00
One gross of more.....℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00
Pike Mfg. Co., 1901 list:
Black Diamond S. S..℔ gro. $12.00
Lamoille S. S.....℔ gro. $11.00
White Mountain S. S.℔ gro. $9.00
Green Mountain S. S..℔ gro. $6.00
Extra Indian Pond S.S.℔ gro. $7.50
No. 1 Indian Pond S.S.℔ gro. $7.00
No. 2 Indian Pond S.S.℔ gro. $4.50
Leader Red End S. S.℔ gro. $4.50
Quick Cut Emery....℔ gro. $10.00
Pure Corundum.....℔ gro. $18.00
Crescent.....$7.00
Emery Scythe Rifles, 2 Coat, $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%
} 33⅓%

Stoppers, Bottle—

Victor Bottle Stoppers.....℔ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ℔ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots.....25&20%

Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
Socket .....doz. $1.60
Bullard, ℔ doz.....$4.00
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00.....20%

Strops, Razor—

Star Diagonal Strop.....25%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Louis XV, Roller Bearing, Gold Plated $120.00
Hepplewhite, Roller Bearing, Silver Plated.....$72.00
Sheraton, Roller Bearing, N'kel.$60.00
Ye Mission, Roller Bearing, Oxidized Coppered.....$36.00
Transparent, Roller Bearing, Plate Glass top, Nickeled.....$36.00
National Queen, Roller Bearing, Fancy Veneers.....$27.00
Loyal, Roller Bearing, Veneers, Nickeled $25.00
Triple Medal, Roller Bearing, Nickeled $24.00
Marion, Roller Bearing, N'kel.$24.00
Marion Queen, Roller Bearing, Nickeled $21.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller Bearing, Jap..$20.00
Perpetual, Regular B'r'gs, N'kel.$20.00
Perpetual, Regular B'r'gs, Jap..$18.00
Monarch Extra (17 in. case), Roller Bearing, Nickeled.....$36.00
Monarch Extra (17 in. case), Roller Bearing, Japanned.....$33.00
Auditorium (26 in. case), Roller Bearing, Nickeled.....$54.00
Mammoth (30 in. case), Roller Bearing, Nickeled.....$60.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Streator Metal Stamping Co.:
Model E, Sanitaire.....℔ doz $25.00
Model A, Sterling.....℔ doz. $25.00
Model B, Sterling, Nickeled.....℔ doz. $23.00
Model B, Sterling, Japanned.....℔ doz. $21.00
Model C, Sterling.....℔ doz. $21.50
Model D, Sterling.....℔ doz. $19.50

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks.... 90&40@—%
American Cut Tacks..90&40@—%
Swedes Cut Tacks....90&40@—%
Swedes Upholsterers'..90&50@—%
Gimp Tacks.....90&50@—%
Lace Tacks.....90&40@—%
Trimmers' Tacks....90&40@—%
Looking Glass Tacks....65@—%
Bill Posters' and Railroad Tacks, 90&50@—%
Hungarian Nails.....85@—%
Finishing Nails.....70&10@—%
Trunk and Clout Nails..80@—%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks..... 90&5 or 6 tens

See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, R. M. Co.	30-gal. $3.40
Emerald, R. M. Co.	60-gal. $4.25
Queen City, R. M. Co.	30-gal. $3.65
Queen City, R. M. Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin ..50@—%
Patent Leather.....25@30&5%
Steel .....33 1-3&5%
Chesterman's .....25@25&5%

Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list, 35@35&5%; Pocket, 35@35&5%.
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $2.75@$3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 50%.

Miniature—

Smith & Hemenway Co.'s.....25%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Imitation Oneida.....75@75&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor .....70&10%
Oneida Community Jump.....50%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $8.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, ℔ gro., 5 in., $4.80; 6 in., $6.00.
Never-Break Steel Garden Trowels.. ℔ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....℔ doz. $16.00
Grocery .....℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....℔ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....℔ doz. $18.50

Tubs, Wash—

No.	*1*	*2*	*3*
Galvanized, per doz.	*$4.25*	*4.75*	*5.25*

Galvanized Wash Tubs (R. M. Co.):

No.	1	2	3	10	20	30
Per doz., net.	$5.70	6.30	7.20	6.60	7.20	8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*.22@24¢*	
No. 12, ¼ and ½-lb. Balls	*.18@20¢*	
No. 18, ¼ and ½-lb. Balls	*.16@18¢*	
No. 24, ¼ and ½-lb. Balls	*.16@18¢*	
No. 36, ¼ and ½-lb. Balls	*.15@17¢*	
Chalk Line, Cotton Balls	*¼-lb. .....25@30¢*	

Cotton Mops, 6, 9, 12 and 15 lb. to doz.....10@18¢
Cotton Wrapping, 5 Balls to lb., acording to quality...14½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls.....13@14¢
American 3-Ply Hemp, 1-lb. Balls .....13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine).....9¢
India 3-Ply Hemp, 1-lb. Balls..9¢
India 3-Ply Hemp, 1½-lb. Balls. 7½@8½¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls .....9½@10½¢
Mason Line, Linen, ½-lb. Bls..46¢
No. 25½ Mattress, ¼ and ½-lb. Balls .....87¢
Wool, 3 to 6 ply....B 7¢; A 7½¢

Vises—

Solid Box.....60%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50.
Machinist and Tool Makers' No. 4A, $12.50; No. 5A, $7.00; No. 6A, $10.00; No. 10A, $22.50.
Presto Quick Acting.....25@25&5%
Tiger Machinists'.....40%
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5@70%
Lewis Tool Co.:
Adjustable Jaw.....30%
Monarch, 50%; Solid Jaw.....50%
Massey Vise Co.:
Clincher 40%
Perfect, 20%; Lightning Grip.....20%
Merrill's 20%
Millers Falls.....60&10%
Parker's:
Victor, 20@25%; Regulars.....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60
Prentiss .....20@25%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30.....25%
Perfection Saw Clamps, ℔ doz....$4.50
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip, 15%; Perfect.....15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series, 60%; 187 Series, 60&5%; No. 870, 40%.

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10..... 1.25
P. E., 8..... 1.50
P. E., 7..... 1.50
Ely's B. E., 11 and larger..$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Dis. 15%

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware: Enameled 55%
Ground 60%
Plain or Unground.....65%
Country Hollow Ware, per 100 lbs. $2.75
White Enameled Ware: Maslin Kettles.....70%
Covered Wares Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....60%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&50@50&10%
Never Break Spiders and Griddles..... 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1⅛ 1¼ Inch. 10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt... 5-16 ⅜ ½ ⅝ ¾
Washers ..$5.40 4.50 3.20 3.00 2.80
The above prices are based on $6.00 off list.

In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Weather Strip—

Flexible Felt—

Lined, per 100 ft., $2; $3; $4.....40&10%
Moore's Unlined, per 100 ft., $2; $3; $4 .....50&10%

Wedges—

Oil Finish.....lb. 2.70@2.80¢

Weights—Hitching—

Covert Mfg. Co.....40%

Sash—

Per ton, f.o.b. factory:
Eastern District...$27.50@$28.00
Southern Territory.$20.00@$23.00
Western and Central Districts .....$23.00@$25.00

Wheels, Well—

8-in., $1.55; 10-in., $2.00; 12-in., $2.50; 14-in., $4.00.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80%
10 to 18.....80&2½%
19 to 26.....80&7½%
27 to 36.....80&2½%
Galvanized:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 16.....72½&10&2½%
19 to 26.....75%
27 to 36.....72½%
Coppered:
6 to 9.....75&5%
10 to 14.....75&7½%
15 to 18.....72½&10&2½%
19 to 26.....75&10&5%
27 to 36.....75%
Tinned:
6 to 14.....75&10&2½%
15 to 18.....75&7½%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&5@60&10&5%
Brass, list Feb. 26, '96.....15%
Copper, list Feb. 26, '96.....25%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24 '03....90&20@90&25%
Brass Cup Hooks and Brass Screw Hooks.....85@—%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&5@80&10%
Painted Screen Cloth, 100 ft., $1.00@1.10
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3¼¢
No. 6 Mesh, sq. ft.....3½¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural .....75&10&5@80%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10%
Alligator Pattern, 70%; Bull Dog..70%
Bemis & Call's:
Adjustable S, 40%; Adjustable S Pipe, 40%; Briggs Pattern, 40%; Combination Bright, 40%.
Bemis Pipe.....60%
Combination Black.....40&5%
Merrick Pattern.....50%
Boardman's 40%
Coes' Genuine Knife Hdl..40&10&5&5%
Coes' Genuine Steel Hdl..40&10&5&5%
Coes' Genuine Key Model..40&10&5&5%
Coes', Genuine Hammer Handle..... 40&10&5&5%
Coes' "Mechanics'"...40&10&10&5&5%
Donohue's Engineer.....40&10%
Eagle .....50&10%
Elgin Wrenches, ℔ doz.....$6.25
Elgin Rethreading Attachment, one die, ℔ doz.....$6.25
Elgin Extra Dies, ℔ doz.....$3.00
Elgin Extra Jaws, ℔ doz.....$1.75
Elgin Monkey Wrench Pipe Jaws, ℔ doz.....$2.10
Gem Pocket.....20%
Hercules 70%
W & B. Machinist:
Case lots.....50&5%
Less than case lots.....50%
W. & B. Railroad Special:
Case lots.....50%
Less than case lots.....40&10&5%
Solid Handles, P., S. & W.....50&5%
Stillson 65%
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz.....$0.80

Wringers—

Tuttle Roller Press Mop Pail Wringer, each, $8.00; ℔ doz.....$48.00

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters'.....list net

Zinc—

Sheet.....per 100 lbs., $8.15@8.40

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from store—

Refined Iron:	
1 to 1½ in. round and square	₩ lb 2.00¢
1½ to 4 in. x ⅜ to 1 in.	₩ lb 2.00¢
1½ to 4 in. x ⅛ to 5-16	₩ lb 2.20¢
Rods—⅜ and 11-16 round and square	₩ lb 2.20¢
Angles:	Cts ₩ lb
3 in. x ¼ in. and larger (except 3½ in. and 4 x ¼ size)	2.45¢
3 in. x 3 16 in. and ⅛ in.	2.55¢
1½ to 2½ in. x ⅛ in.	2.35¢
1½ to 2½ in. x 3-16 in. and thicker	2.30¢
1 to 1¼ in. x 3-16 in.	2.35¢
1 to 1¼ x ⅛ in.	2.40¢
⅞ x ⅛ in.	2.55¢
¾ x ⅛ in.	2.65¢
⅝ x ⅛ in.	3.70¢
½ x 3-32 in.	4.20¢
Tees:	
1 in.	2.65¢
1¼ in.	2.45¢
1½ to 2½ in.	2.35¢
3 in. and larger	2.50¢
Beams	2.30¢
Channels, 3 in. and larger	2.30¢
Bands—1½ to 6 x 3-16 to No. 8	2.35¢
"Burden's Best" Iron, base price	3.05¢
Burden's "H. B. & S." Iron, base price	3.00¢
"Ulster"	3.10¢
Norway Bars	3.40¢
Norway Shapes	3.80¢

Merchant Steel from Store—

	per lb
Bessemer Machinery	2.00¢
Toe Calk, Tire and Sleigh Shoe	2.50@3.00¢
Best Cast Steel, base price in small lots	7¢

Sheets from Store—

Black.

	One Pass, C.R. Soft Steel.	R. G. Cleaned.
No. 14	₩ lb 2.80	2.90¢
Nos. 18 to 21	₩ lb 2.95	3.05¢
No. 27	₩ lb 3.10	3.40¢
No. 28	₩ lb 3.20	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ lb 11¾@14¢
Patent Planished	₩ lb A, 10¢; B, 9¢, net.

Galvanized.

Nos. 14 to 16	₩ lb, 3.15¢
Nos. 22 to 24	₩ lb, 3.55¢
No. 27	" " 4.00¢
No. 28	" " 4.15¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Tin Plates—

American Charcoal Plates (per box.)

A.A.A. Charcoal:	
IC, 14 x 20	$6.45
IX, 14 x 20	7.70
A. Charcoal:	
IC, 14 x 20	$5.50
IX, 14 x 20	6.70

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 108 lb	$4.50
IX, 14 x 20	6.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8 70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

Outside Diameter. Net. Base Price 22¢

Stubs' W. G.	⅜	7-16	½	9-16	⅝	¾	⅞	1	1¼	1½	1¾	2
4-11	..	....	..	....	..	..	..	..	22	22	....	..
12	..	....	..	....	28	28	27	27	22	22	22	22
13	..	....	..	....	29	29	27	27	22	22	22	22
14	..	....	29	29	29	27	27	27	23	23	22	22
15	..	30	29	29	29	27	27	27	23	23	23	23
16	30	30	29	29	29	27	27	27	24	24	23	23
17	30	30	29	29	29	27	27	27	25	25	24	24
18	31	31	30	30	30	28	28	28	26	26	25	25
19	31	31	30	30	30	28	28	28	27	27	26	26
20	31	31	30	30	30	28	28	28	28	28	27	27
21	33	32	32	30	29	29	29	29	29	29	28	28
22	35	35	8	33	31	30	30	30	30	30	29	29
23	37	37	35	35	33	33	33	33	33	33	30	30
24	53	48	46	45	44	43	41	40	40	41	33	33
25	56	51	49	47	46	45	44	44	45	46	41	42

Iron Pipe Sizes—Brass

⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6 inch
30	29	24	23	23	22	22	22	22	24	22	23	24	26	28	29¢ ₩ lb

Brazed Brass Tubing.

Discount from List June 6, 1898, 20&5%.

Bronze and Copper Tubing advance on Brass List 3¢

Roll and Sheet Brass—

Discount from List June 6, 1898, 15%.

Brass Wire.

Discount from List June 6, 1898, 15%

Brass Rods.

Discount from List 15%

METALS—

Tin—

Straits Pig	₩ lb 38¼@38¾¢

Copper—

Lake Ingot	₩ lb 19 @19¼¢
Electrolytic	₩ lb 18¾@18¾¢
Casting	₩ lb 18½@18¾¢
Sheet Copper Hot Rolled, 16 oz.	₩ lb 23¢
" " " 14 "	" " 24¢
Sheet Copper Cold Rolled, 1¢ ₩ lb advance over Hot Rolled.	
Sheet Copper Polished 20 in. wide and under, 1¢ advance over Cold Rolled.	
Sheet Copper Polished over 20 in. wide, 2¢ advance over Cold Rolled.	
Bottoms, Pits and Flats	₩ lb 27¢ basis
Planished Copper, 1¢ ₩ lb more than Polished.	

Spelter—

Western	₩ lb 6¼ @ 6¾¢

Zinc.

No. 9, base, casks, ₩ lb 8¼¢ | Open	₩ lb 8¾¢

Lead.

American Pig	₩ lb 6½@6¾¢
Bar	₩ lb 6½@7¼¢

Solder.

½ & ½, guaranteed	₩ lb 23½@24 ¢
No. 1	₩ lb 21¾@22¼¢
Refined	18¾@19

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson	₩ lb 25@26¢
Hallett's	26@27¢
Other Brands	22@24¢

Aluminum—

No. 1 Aluminum (guaranteed over 90% pure), in ingot for remelting:	
Small lots	40c
100-lb lots	38c

Old Metals.

Dealers' Purchasing Prices Paid in New York.

Copper, Heavy Cut and Crucible	₩ lb 14.00¢
Copper, Heavy and Wire	₩ lb 13.75¢
Copper, Light and Wire	₩ lb 14.25¢
Heavy Brass	₩ lb 10.75¢
Light Brass	₩ lb 8.50 ¢
Lead	₩ lb 5.25 ¢
Tea Lead	₩ lb 5.00 ¢
Zinc	₩ lb 4.25 ¢
Pure Aluminum, Sheet	₩ lb 26 ¢
No. 1 Yard Wrought	$ 4.50@15.00
Wrought Pipe	$10.5 @11.00
No. 1 Machinery Cast	$13.75@14.25
Stove Plate	$ 9.75@10.25

THE IRON AGE

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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